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ADMINISTRATIVE REMOVAL

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A-80-40
IV-F-9

MEMORANDUM

DATE: March 19, 1984

TO: Docket A-80-40
(Arsenic NESHAP)

FROM: Roy Manley
Pacific Environmental Services, Inc.

SUBJECT: Documentation Concerning the Public Workshop
Held August 10, 1983, at Tacoma, Washington

The documents attached were generated or used at the public arsenic workshop held August 10, 1983, at Tacoma, Washington. The following list describes the attached documents:

| TO | FROM | DATE | DESCRIPTION |
|--------|----------------------------|-----------------|---|
| --- | ---- | August 1983 | Workshop agenda and schedule of speakers and events |
| EPA | Public (281 signatures) | August 10, 1983 | Sign-in record sheet for workshop attendees |
| --- | --- | --- | Fact Sheets distributed at the workshop: Arsenic Controls Superfund and ASARCO Risk to Public Health |
| Public | EPA Region X | July 12, 1983 | News Release concerning proposed standards |
| Public | EPA Washington, D.C. | July 12, 1983 | News Release concerning the proposed standards |
| Public | EPA | August 3, 1983 | News Release concerning three public workshops in Tacoma |

AR 18.3.6 0003

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A-80-40
IV-F-9

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| TO | FROM | DATE | DESCRIPTION |
|--------------------------------|--|-----------------|---|
| Public | EPA Region X | August 1983 | News Release: "Environmental Information" |
| Public | EPA | August 1983 | Charts, tables (copies of slides) used in the workshop presentations |
| Public | EPA William Ruckelshaus | June 22, 1983 | Excerpt of speech presented by William Ruckelshaus to National Academy of Science |
| Public | EPA | August 1983 | Smelter process diagrams |
| Dana Davoli EPA Region X | Brian Baird Tacoma | August 12, 1983 | Mr. Baird's proposal to EPA for research support concerning public opinion on environmental standards, the smelter, etc. |
| EPA | Public (25 separate requests) | August 20, 1983 | List of Vashon Island resident requests for copies of the <u>Federal Register</u> |
| EPA Region X | Public (22 separate letters; see attached index) | August 1983 | Public comment forms completed at or following the workshop |
| EPA | Public | August 10, 1983 | Summary list of questions and issues raised by the public at the workshop |
| --- | --- | August 10, 1983 | Audio tapes of the workshop proceedings (original and complete tapes are kept in the docket in Washington, DC) |

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Public comments forms received following the close of the workshop.

| <u>Number</u> | <u>Name</u> |
|---------------|-------------|
| IV-F-9a | (b) (6) |
| IV-F-9b | |
| IV-F-9c | |
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| IV-F-9g | |
| IV-F-9h | |
| IV-F-9i | |
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| IV-F-9m | |
| IV-F-9n | |
| IV-F-9o | |
| IV-F-9p | |
| IV-F-9q | |
| IV-F-9r | |
| IV-F-9s | |
| IV-F-9t | |
| IV-F-9u | |
| IV-F-9v | |

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U.S. ENVIRONMENTAL PROTECTION AGENCY

AGENDA

PUBLIC WORKSHOP
PROPOSED ARSENIC STANDARDS

August, 1983

| | | |
|-------|-----------------------------|--|
| 6:30 | Registration | |
| 7:00 | Welcome and Introductions | Alexandra Smith Director, Air & Waste Mgmt. Div. Region 10 |
| | Opening Remarks | Ernesta B. Barnes Administrator, Region 10 |
| | Assessing the Health Risks | Elizabeth Anderson Director, Office of Health and Environmental Assessment, Research Triangle Park, North Carolina |
| | Proposed Control Technology | Robert Ajax Chief, Standards Development Branch, Research Triangle Park |
| 7:50 | Discussion Groups | EPA staff will rotate among groups to answer questions |
| 9:25 | Reconvene | |
| 9:30 | Summary Remarks | Ernesta B. Barnes |
| 10:00 | Wrap-up | |

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U.S. ENVIRONMENTAL PROTECTION AGENCY

PUBLIC WORKSHOP

DATE

August 10, 1982

LOCATION

McMurray Vashon Island

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Vashon

| NAME | ADDRESS | REPRESENTING |
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| (b) (6) | | <u>Maury</u> |
| | | <u>(Maury Is-Melita)</u> |
| | | <u>KNOWLEDGE</u> |
| | | <u>Burton</u> |
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Washon

| NAME | ADDRESS | REPRESENTING |
|-------------------|---------|---------------------------------|
| (b) (6) | (b) (6) | myself |
| R. G. MOORE | (b) (6) | JASITON COMMUNITY COUNCIL |
| (b) (6) | (b) (6) | myself |
| (b) (6) | (b) (6) | self |
| (b) (6) | (b) (6) | self |
| (b) (6) | (b) (6) | self |
| ROBERT J. BACKHEW | (b) (6) | EPA |
| (b) (6) | (b) (6) | myself - clark |
| (b) (6) | (b) (6) | myself |
| (b) (6) | (b) (6) | myself & family |
| (b) (6) | (b) (6) | myself |
| (b) (6) | (b) (6) | self |
| (b) (6) | (b) (6) | self |

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83

LOCATION McMurray School - Vashon

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Vashon

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| NAME | ADDRESS | REPRESENTING |
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| (b) (6) | (b) (6) | (b) (6) |
| Patricia D. Hail | (b) (6) | Self |
| Michael O. Varner | (b) (6) | U.S. P.H.S./IHS |
| John H. Gordon | (b) (6) | ASARCO |
| (b) (6) | (b) (6) | ASARCO |
| (b) (6) | (b) (6) | Residents |
| (b) (6) | (b) (6) | Residents |
| Floyd Frost | 1409 Smith Tower Seattle | OSHS |
| Shirley Smith | (b) (6) | Port of Puget Sound King County |
| (b) (6) | (b) (6) | RESIDENTS |
| (b) (6) | (b) (6) | ten Resident |
| (b) (6) | (b) (6) | Self-resident |
| (b) (6) | (b) (6) | self-resident |
| (b) (6) | (b) (6) | Resident |

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Vashan

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| (b) (6) |  | resident |
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| | | Dooley |
| (b) (6) | | League of Women Voters WA. |
| | | LWV |
| | | LWV |
| (b) (6) |  | Mr. Saff |
| | | family of 4 |
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| | | FAMILY |
| | (b) (6) | 98013 - SELF |

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE Aug. 10, 1983
LOCATION McMurray - Vashon

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PUBLIC WORKSHOP

DATE _____
LOCATION _____

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PUBLIC WORKSHOP

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LOCATION Washen

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE _____
LOCATION _____

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ADDRESS

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8/10/83

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Vision

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ADMINISTRATIVE REMOVAL

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Tacoma Pierce
County Health Dep

Steven M. Mordich

(b) (6)

ASARCO

(b) (6)

citizen

Citizen

(b) (6)

American Sea
Vegetables Company

Kristine Wicklund

1409 Smith Tower
Seattle, WA 98104

DSHS - Health Div.

(b) (6)

IRATE

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CITIZEN

Citizen

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Newham Island

| NAME | ADDRESS | REPRESENTING |
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| (b) (6) | | IRATE |
| (b) (6) | | Concerned Citizen |
| (b) (6) | | T. H. E. Concerned Citizen |
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| (b) (6) | | live at 13 Self, Duckton |
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Washon

| NAME | ADDRESS | REPRESENTING |
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 5-10-83
LOCATION Washington

| NAME | ADDRESS | REPRESENTING |
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| (b) (6) | | Self |
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Clashan

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| (b) (6) | | Concerned landowners/ Maurice J. Local Gardeners Concerned Citizen local gardening land. owner |
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Vashon

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| (b) (6) | | VASHON |
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Wichita

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Vashon

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San King Co. Dept. of Health

freelance news reporter
(Benchamber)

Seattle

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8/10/83

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U.S. ENVIRONMENTAL PROTECTION AGENCY

PUBLIC WORKSHOP

DATE 8/10/83

LOCATION Vishon

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Community Council
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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8-10-83
LOCATION Washon

| NAME | ADDRESS | REPRESENTING |
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| (b) (6) | | |
| | | |
| | | CONCERNED CITIZEN |
| | | " |
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| | | Vashon Mamm Comm Council Pres |
| | | Concerned citizen UNITED STEELWORK LOCAL 25 |
| | | Concerned citizen VASHON RESIDENT |
| | | Concerned citizen Vashon Island |

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8/10/83

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83

LOCATION Vashon

NAME

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Washington

NAME

ADDRESS

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U.S. ENVIRONMENTAL PROTECTION AGENCY

PUBLIC WORKSHOP

DATE 8/10/83LOCATION Uashon

NAME

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Bogert's Beach, Fl.

Jim Nolan

9067 9863, Seattle

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Representative Jan Marie Brough

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Representative Dick Schoon

2669 S 300TH St. Fed. Way 30TH Dist.

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ADMINISTRATIVE REMOVAL

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U.S. ENVIRONMENTAL PROTECTION AGENCY
PUBLIC WORKSHOP

DATE 8/10/83
LOCATION Washon

NAME

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ADMINISTRATIVE REMOVAL

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SCIENCE, RISK AND PUBLIC POLICY

...EPA is an instrument of public policy, whose mission is to protect the public health and environment in the manner laid down by its statutes. That manner is to set standards and enforce them; and our enforcement powers are strong and pervasive. But the standards we set, whether technology or health-related, must have a sound scientific base.

Science and the law are thus partners at EPA, but uneasy partners. It's a shotgun wedding. The main reason for the uneasiness lies, I think, in the conflict between the way science really works and the public's thirst for certitude that is written into EPA's laws.

...But EPA's laws often assume, indeed demand, a certainty of protection greater than science can provide at the current state of knowledge. The laws do no more than reflect what the public believes and what it often hears from people with scientific credentials on the 6 o'clock news. The public thinks we know what all the bad pollutants are, precisely what adverse health or environmental effects they cause, how to measure them exactly and control them absolutely. Of course, the public and sometimes the law are wrong, but not all wrong. We do know a lot about some pollutants and we have controlled them effectively using the tools of the Clean Air Act and the Clean Water Act. These are the pollutants for which the scientific community can set safe levels and margins of safety for sensitive populations. If this were the case for all pollutants, we could breathe more easily (in both senses of the phrase); but it is not so.

...It will not be easy, because we must now deal with a class of pollutants for which a safe level is difficult, if not impossible, to establish. These pollutants interfere with genetic processes and are associated with the diseases we fear most: cancer and reproductive disorders, including birth defects. The scientific consensus has it that any exposure, however small, to a genetically active substance embodies some risk of an effect. Since these substances are wide-spread in the environment, and since we can detect them down to very low levels, we must assume that life now takes place in a minefield of risks from hundreds, perhaps thousands, of substances. No more can we tell the public: you are home free with an adequate margin of safety.

This worries all of us, and it should. But when we examine the premises on which such estimates of risk are based, we find a confusing picture. In assessing a suspected carcinogen, for example, there are uncertainties at every point where an assumption must be made: in calculating exposure; in extrapolating from high doses where we have seen an effect to the low doses typical of environmental pollution; in what we may expect when humans are subjected to much lower doses of the same substance that caused tumors when given in high doses to laboratory animals; and finally, in the very mechanisms by which we suppose the disease to work.

Excerpts from a speech by William D. Ruckelshaus, Administrator, Environmental Protection Agency, to the National Academy of Sciences on June 22, 1983.

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Further, we must search for ways of describing risk in ways the average citizen can comprehend. Telling a family living close to a manufacturing facility that no further controls are needed on the plants's emissions because, according to our linear model their risk is only 10^{-6} , is not very reassuring. We need to describe the suspect substances as clearly as possible, tell people what the known or suspected health problems are and help them compare that risk to those with which they are more familiar.

To effectively manage the risk, we must seek new ways to involve the public in the decision-making process. Whether we believe in participatory democracy or not it is a part of our social regulatory fabric. Rather than praise or lament it, we should seek more imaginative ways to involve the various publics impacted by the substance at issue. They need to be involved early on and they need to be informed if their participation is to be meaningful. We will be searching for ways to make our participatory process work better.

For this to happen, scientists must be willing to take a larger role in explaining the risks to the public--including the uncertainties inherent in any risk assessment. Shouldering this burden is the responsibility of all scientists, not just those with a particular policy end in mind. In fact all scientists should make clear when they are speaking as scientists--ex cathedra--and when they are recommending policy they believe should flow from scientific information. What we need to hear more of from scientists is science...Our country needs the clear unbiased voice of science.

...Lest anyone misunderstand, I am not suggesting that all the elements of managing risk can be reduced to some neat mathematical formula. Going through a disciplined approach can help. It will assist in organizing our thoughts to include all the elements that should be weighed. We will build up a set of precedents that will assist later decision-making and provide more predictable outcomes for any social regulatory programs we adopt.

It is clear to me that in a society in which democratic principles so dominate, the perceptions of the public must be weighed. Instead of objective and subjective risks, the experts sometimes substitute "real" and "imaginary" risks. There is a certain arrogance in this -- an elitism which has ill served us in the past. Rather than decry the ignorance of the public and seek to ignore their concerns, our governmental processes must accommodate the will of the people and recognize its occasional wisdom. As Thomas Jefferson observed:

"If we think (the people) not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion."

A FACT SHEET

ARSENIC CONTROLS

WHY THE SPECIAL ATTENTION FOR ASARCO'S TACOMA SMELTER?

The ASARCO smelter in Tacoma uses copper ore concentrate with a much higher arsenic content than any other U.S. copper smelter. Arsenic makes up about four percent of the ore at Tacoma; no other copper smelter uses ore concentrate with more than 0.6 percent.

Arsenic is a commercially valuable by-product of the Tacoma operation. The smelter is the only U.S. manufacturer of arsenic and arsenic trioxide; it produces one-third of all arsenic used in the country.

WHAT IS EPA PROPOSING FOR THE TACOMA SMELTER?

There are three principal phases in the smelting process that transforms raw ore into blister copper. (1) The ore is first run through a roaster as an initial step in gradually removing impurities. (2) What emerges from the roaster is run through a reverberatory furnace. (3) The molten mixture from the furnace is then sent to converters. EPA seeks to reduce the emissions of arsenic that escape capture in the third step, e.g., the converting process.

EPA is proposing that additional hoods be placed on the converters so that ASARCO would capture and collect "fugitive" arsenic given off during this third stage in removing impurities from the copper.

The EPA proposal would include a standard expressed in terms of equipment specifications for the collection device. The criterion used by EPA in designing this standard is what is called the "Best Available Technology", or BAT. BAT means the best controls available considering economic, energy, and environmental impacts. BAT is the minimum level of control which EPA would require for hazardous air pollutants such as arsenic.

IS THE PROPOSED "BEST AVAILABLE TECHNOLOGY" INDEED THE BEST ASARCO CAN DO?

One of the chief issues during the public hearing/public comment process is whether EPA's proposed standard does, in fact, represent the very best control technology available to ASARCO. Are there other operations or practices at the smelter where additional control can be employed to reduce emissions of arsenic?

There have been discussions among air pollution control engineers involved in the ASARCO-arsenic issue that other measures may exist which can be applied to produce even greater reductions in ASARCO's arsenic emissions. One example which has been suggested has been baghouse controls on the reverberatory furnaces which may play a major role in reducing the amount of arsenic which now escapes.

Other suggestions have been made that ASARCO may be able to reduce fugitive emissions throughout the smelter and that consideration be given to require ASARCO to use ore concentrate with a lower arsenic content. The feasibility of such requirements and the quantification of emission reduction and cost is the subject of an ongoing EPA task force effort. Comments from the public are encouraged and welcomed.

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WHAT WOULD EPA'S PROPOSED CONTROLS COST ASARCO?

EPA has estimated that it would cost ASARCO \$3.5 million to install the hooding equipment required by the proposed controls, and that the annual cost to operate the equipment would be \$1.5 million. Operation of the equipment is expected to increase the smelter's annual energy consumption by one-half of one percent over the 2.9 billion kilowatt hours of electricity the smelter now uses each year. EPA has estimated that its proposed controls could result in an increase in the price of copper by approximately 0.8 percent if the company chose to maintain its normal profit margin. The cost may be higher if additional or alternative controls are found to be necessary.

IS SHUTDOWN OF THE SMELTER A POSSIBILITY?

Yes, it is a possibility.

Regulation of hazardous air pollutants such as arsenic is required by Section 112 of the Clean Air Act. The only absolutely safe approach to setting standards for substances which cause cancer would be to set a standard that would reduce the emissions to zero. In setting standards previously for two other cancer-causing air pollutants, asbestos and vinyl chlorides, EPA promulgated standards that did not require shutdown of facilities that released those pollutants to the ambient air.

EPA can impose standards that go beyond Best Available Technology if, in the language of the statute, it is necessary "to protect the public health....with an ample margin of safety."

A FACT SHEET
SUPERFUND AND ASARCO

WHAT IS SUPERFUND?

Superfund is the Federal program that allows EPA -- with the participation of State governments -- to respond directly to releases (or threatened releases) of hazardous substances and pollutants or contaminants that may endanger public health or welfare. The program was set up by the Comprehensive Environmental Response, Compensation and Liability Act of 1980. The law is referred to as "CERCLA", or, more popularly, as the Superfund law because it created a \$1.6 billion fund to deal with problems resulting from hazardous materials in the environment.

HOW DOES SUPERFUND COME INTO PLAY?

In April 1983, the Washington Department of Ecology (DOE) signed an agreement with EPA that called for DOE to lead a \$1.4 million EPA-funded investigation of contamination by hazardous chemicals in an area described as the Commencement Bay Nearshore/Tideflats area. The area includes Ruston, site of the ASARCO smelter. A sum of \$100,000 will be devoted to investigate contamination in Ruston, Maury Island and Vashon Island. Soils in those vicinities are known to contain arsenic and cadmium in amounts that have prompted the Tacoma-Pierce County Health Department and the Seattle-King County Health Department to issue warnings about the consumption of garden vegetables grown in contaminated soils.

WHAT IS THE OBJECT OF THE SUPERFUND INVESTIGATION?

The investigation, to be managed by DOE and the Tacoma-Pierce County Health Department, will attempt to establish the pathways by which arsenic finds its way into the urine of school children. There are a number of suspected pathways: household dust, windblown dust from unpaved lots and roads, vegetable intake, playground soil and smelter emissions. DOE and the health department will attempt to determine the most significant pathways. According to the current schedule, the investigation should be completed by November 1984. Once the pathways are established, EPA has the authority to order the source of the contamination, if known, to take corrective action that will eliminate the risk to health. If a source of the contamination refused to undertake the clean-up, EPA has the legal authority to do the job itself with the understanding that all costs incurred must be repaid to EPA by the source.

WHAT IS SUPERFUND'S RELATIONSHIP TO THE PENDING EPA PROPOSAL?

The pending EPA proposal to place new restrictions on arsenic emissions from ASARCO is separate from the Superfund program, although the two have similar goals. The proposal has as its objective the reduction of arsenic from current and future smelter emissions. The Superfund program is directed toward reducing the health and environmental risks posed by the historic build-up of arsenic in the soil.

Until the joint DOE-health department Superfund investigations are completed, what should or can be done to remedy the historic deposit of arsenic in the soils will not be known. Any cleanup action, however, will be planned with the help of the public. An advisory group is being formed, and will begin meeting soon. For more information about the public's involvement with Superfund activities, contact Derek Sandison of the Tacoma-Pierce County Health Department at (206) 593-4750.

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A FACT SHEET

THE RISK TO PUBLIC HEALTH

Arsenic, in its inorganic form, has long been known as an acute poison to humans when ingested in relatively large amounts. However, more recent data have shown that exposure to lower levels of arsenic results in skin and lung cancer in humans. For cancer-causing substances, such as inorganic arsenic, scientists are unable to identify a safe level of exposure. Therefore, EPA and other federal agencies have taken the position that cancer may occur at any level of exposure to arsenic no matter how low, with the risk of cancer increasing as exposure increases.

For the purpose of developing its arsenic regulation, EPA has determined that the ASARCO smelter should be controlled at a minimum to the level that reflects best available technology (BAT) and to a more stringent level if necessary to prevent health risks that are unreasonable. This approach requires that EPA estimate the cancer risk remaining for the population after these controls are in place and then determine if the remaining cancer risk is acceptable, taking into account the costs and technical feasibility of reducing the risk further.

To calculate this remaining risk, EPA combined data from two different types of analyses. The first analysis provides what is known as the unit risk number. This number is defined as the lifetime lung cancer risk that would occur in a population which is exposed throughout their lifetime to one microgram per cubic meter of arsenic in the air they breathe. (A microgram is equal to about 1/28 millionth of an ounce and a cubic meter is about the same as a cubic yard. Therefore, one microgram per cubic meter is about 1/28 millionth of an ounce of arsenic in a cubic yard of air.) This unit risk number is calculated by using data from studies of workers who were exposed to arsenic in smelters and at a pesticide manufacturing plant.

The second analysis estimates the exposure for residents living near the smelter. This is done with mathematical models. Utilizing data on emissions of arsenic from the ASARCO smelter as well as information on weather and geographic conditions, a dispersion model is used to calculate the concentration of arsenic expected at over one hundred locations within approximately 12 miles of the smelter. Combining these exposure estimates with population data from the Bureau of Census gives an estimate of the number of people exposed to various concentrations of arsenic within about 12 miles of the smelter. This 12 mile distance was chosen because the mathematical models used tend not to be as accurate at a greater distance. (While our analysis stops at about 12 miles, it must be realized that risk from exposure to arsenic emissions extends beyond this distance, though at a reduced level.)

By multiplying the unit risk number and the estimated exposure for people living around the smelter, it is possible to make an estimate of the cancer risks expected in the ASARCO community as a result of arsenic exposure. For those people living within one mile of the smelter, the lifetime cancer risk remaining after controls have been installed would be about 0.2%. This is in addition to the normal lifetime cancer risk of about 20% that would be expected without arsenic exposure. Within the 12 mile area this excess life-time cancer risk, after controls are installed, would be 0.004%. Another way of expressing this risk is by using lung cancer incidence numbers. Lung cancer incidence is the expected number of lung cancer cases that would result each year from arsenic exposure within 12 miles of the smelter. Without additional controls, the estimated lung cancer cases are approximately 4 per year. After the proposed controls were installed, the estimated number would drop to approximately one per year. To keep this in perspective, these numbers should be compared to the several hundred lung cancer deaths that are normally expected each year in a population the size of that found within this 12 mile radius.

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UNCERTAINTIES IN RISK CALCULATIONS

The process of calculating these risks for the population around the smelter involves many assumptions and uncertainties. So while these estimates of risk are a useful tool in the decision-making process, MUCH CAUTION SHOULD BE EXERCISED TO AVOID RELYING TOO HEAVILY ON THE NUMBERS PRESENTED ABOVE. These numbers have considerable uncertainty for the following reasons:

1) MODELING ASSUMPTIONS - Measurement of air concentration of arsenic around the ASARCO plant have not been done thoroughly; however, the measurements that have been obtained indicate lower concentrations than those predicted by the dispersion model. Arsenic emissions data from the smelter used in the dispersion model are not precise. In many cases these emission rates were based on assumptions rather than actual emission tests. This is especially true for fugitive emissions which are very important in calculating concentration yet are very difficult to measure. Also, estimates of how these arsenic emissions mix with the ambient air are hard to determine because of the complex geography and lack of specific weather data for the area around the smelter. These problems may explain why the ambient monitoring around the smelter shows lower concentrations of arsenic than EPA's dispersion model predicts.

2) EXPOSURE ASSUMPTIONS - A principal assumption is that all persons living within the 12 mile radius of the smelter will remain in the same location for a 70 year lifetime and are exposed to a constant, average concentration of airborne arsenic. This assumption could result in large overestimates of arsenic exposure for those who spend a lot of time away from their residences and in underestimates for workers employed at the smelter. Additionally, exposure to arsenic from resuspension of arsenic bearing dusts from city streets, empty lots, and playgrounds has not been taken into consideration.

3) UNIT RISK NUMBER - Because arsenic is a carcinogen, it was assumed that a linear relationship exists between exposure and risk. Simply stated, this means that a person who inhales one microgram of arsenic per cubic meter of air is one-tenth as likely to get cancer as a person who inhales ten micrograms per cubic meter. If the relationship between exposure and risk is not linear, a different unit risk number could result which would in turn change the lung cancer risk estimates made for the population around the smelter. It is unlikely that the actual cancer risks would be higher than those predicted by EPA, but they could be substantially lower.

EPA is now in the process of reviewing the data used in calculating risk estimates, especially those data which relate to arsenic emissions and dispersion modeling. If necessary, new data will be developed in these areas to permit EPA to better estimate risks to the smelter community.

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Official Business
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An Equal Opportunity Employer

United States
Environmental Protection Agency
Region X (M/S 605)
1200 Sixth Avenue
Seattle, WA 98101



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EPA - 335



News Release

83-51

Contact: Bob Jacobson
(206) 442-1203

July 12, 1983



FOR RELEASE AFTER 1 P.M. (PDT), TUESDAY, JULY 12

Today's proposal by the U.S. Environmental Protection Agency to curtail emissions of inorganic arsenic at the ASARCO smelter in Tacoma triggers a comment period during which the public will have an important role in determining exactly what level of pollution controls will provide "an ample margin of safety to protect public health," according to Ernesta B. Barnes, EPA's Northwest regional administrator.

"That phrase -- 'an ample margin of safety' -- is the critical issue in the upcoming public comment period on the EPA proposal," Barnes said. "In making the proposal, EPA is openly acknowledging that our proposed controls for ASARCO will not eliminate risks to health, but will only reduce them.

"The question facing citizens affected by the ASARCO arsenic emissions is whether the reduced health risk is acceptable."

Inorganic arsenic is a probable carcinogen, said Barnes, and therefore can be assumed to present risks at any level of exposure. There is no defined threshold at which risks begin to occur. EPA's policy toward such non-threshold pollutants is that -- as a minimum requirement -- their emissions be reduced by the best control technology available.

(more)

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Barnes also said that EPA will go beyond that minimum criterion of "best available control technology" if necessary to prevent an unreasonable risk to public health.

"During the upcoming public comment period, EPA is encouraging people within the 12.5 mile radius of the smelter to help decide what is an 'acceptable' or 'reasonable' health risk," Barnes said. "In addition, EPA will be soliciting the comments of knowledgeable parties -- ASARCO officials and employees, the engineering community, State and local air pollution control agencies -- who are in the best position to tell EPA whether our proposal does, indeed, represent the best available control technology."

The EPA proposal calls for ASARCO to place hoods on the converters used in the smelting process, a move that would cost ASARCO an estimated \$3.5 million in installation costs and an estimated annual operating cost of \$1.5 million. Use of the hoods is expected to reduce ASARCO's annual emissions of inorganic arsenic from 310 tons to 189 tons.

"Does that requirement constitute the very best control technology available to ASARCO? -- that's what we want to learn during the comment period," Barnes said. "Are there other operations or practices at the smelter where further controls can be employed to reduce emissions of inorganic arsenic?"

Barnes added that ASARCO's ongoing emissions of inorganic arsenic may be only part of the public health risks faced by people living downwind from the smelter.

"Public health officials are concerned by the deposits of arsenic over the years," Barnes said. "Even with future decreases in the amount of arsenic from ASARCO, arsenic concentrations in the soil surrounding the smelter will remain high."

Barnes said the public hearing on EPA's proposal will be held from noon to 10 p.m. on Tuesday, August 30, in the Rotunda Room of the Tacoma Bicentennial Pavillion at 1313 Market Street.. A second day of hearings will be held, if necessary, at the same location on the following day.

Between now and then, Barnes said EPA will conduct public workshops, probably in early August, to acquaint people in Tacoma and nearby Vashon and Maury Islands with details of the EPA proposal and to help them prepare testimony for the hearing. Times and places for the workshop will be announced as soon as arrangements are made.

More information about the hearings and the workshops may be obtained from Laurie Kral, Air Programs Branch (Mail Stop 532) EPA, 1200 Sixth Avenue, Seattle 98101, or by calling her at (206) 442-1089.

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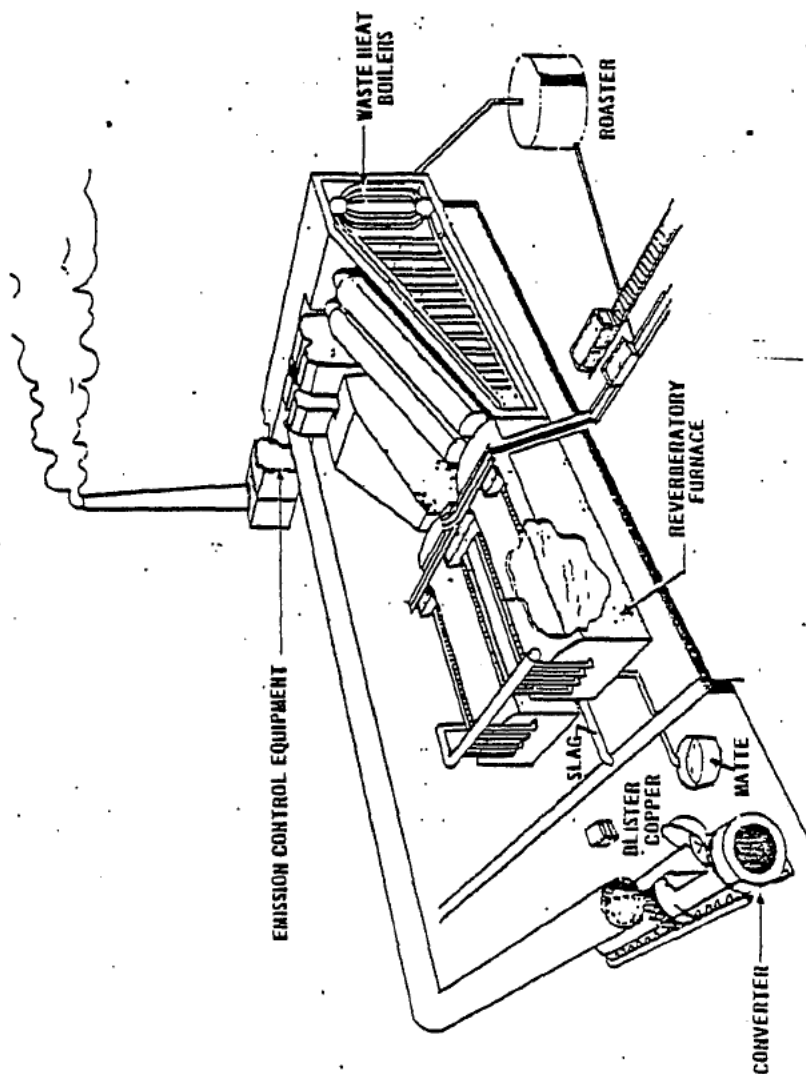
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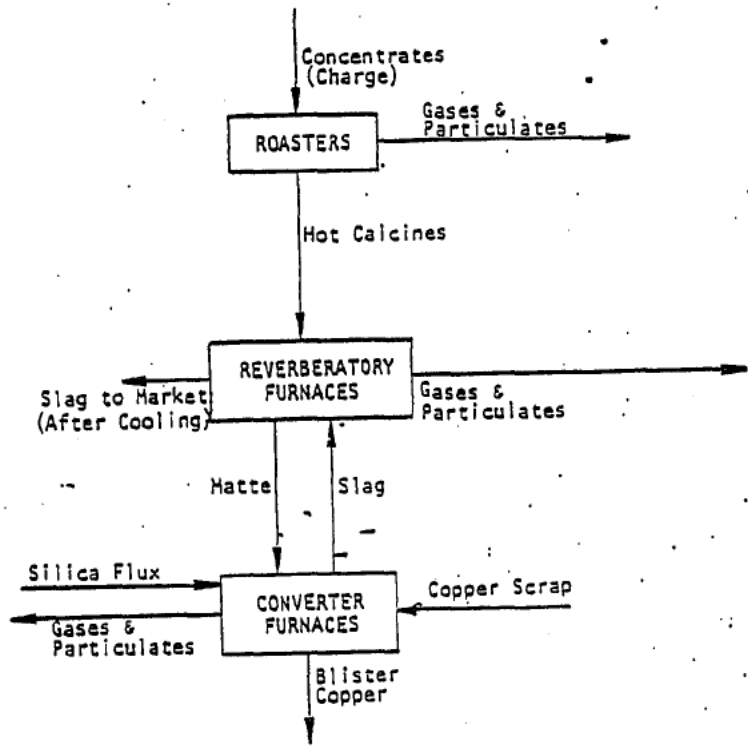
Primary Copper Smelter

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BASIC SMELTING PROCESS USED AT THE TACOMA SMELTER

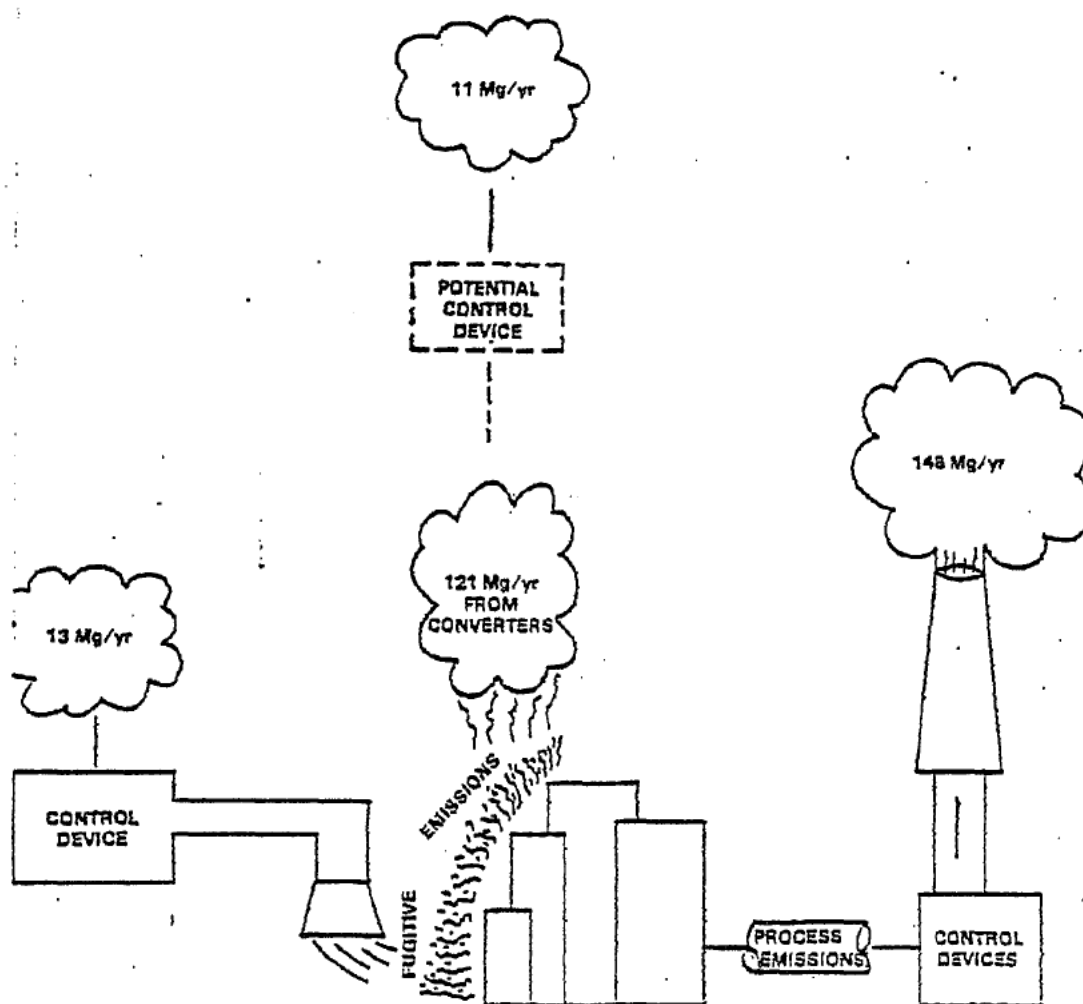
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EMISSIONS FROM ASARCO/TACOMA

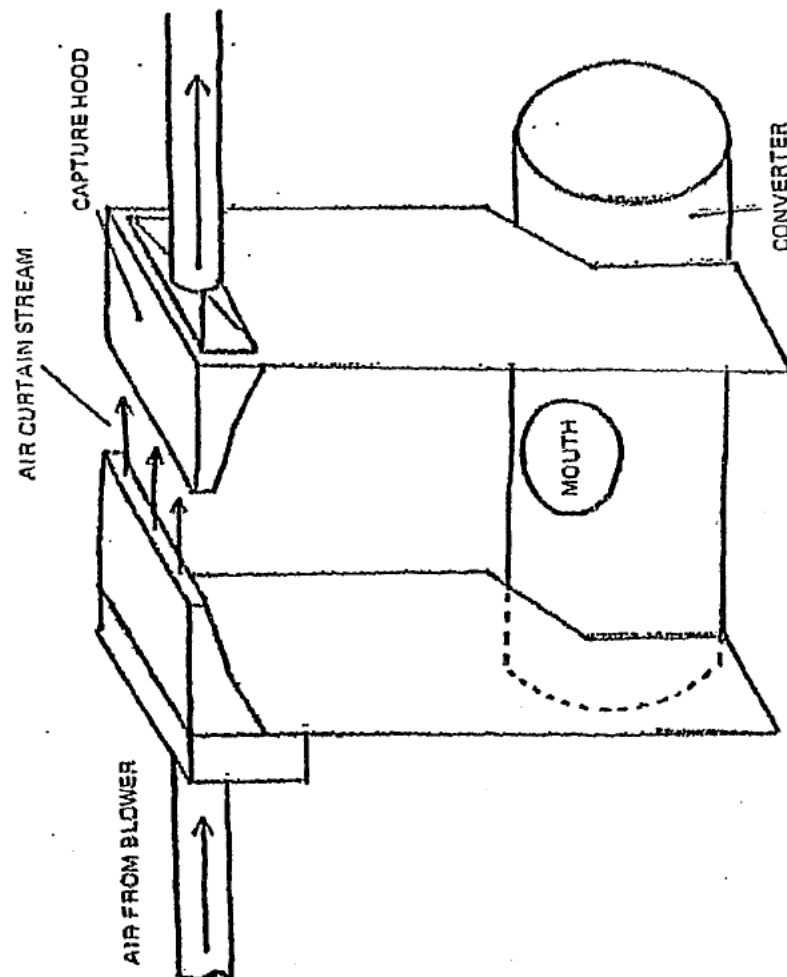


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CONVERTER FIXED ENCLOSURE/AIR CURTAIN (OPEN)

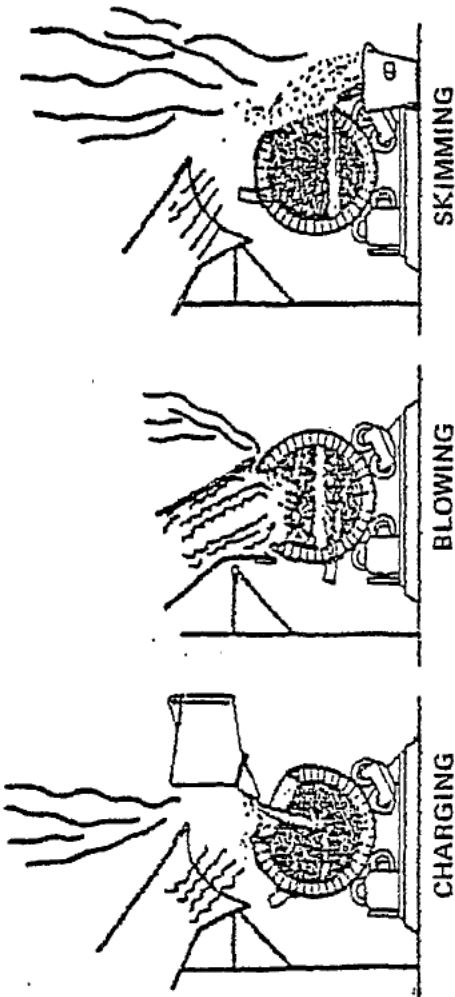
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COPPER CONVERTER OPERATIONS





Environmental Information

FOR RELEASE: TUESDAY, JULY 12, 1983

(202) 382-4355

EPA PROPOSES STANDARDS FOR INORGANIC ARSENIC EMISSIONS

U.S. Environmental Protection Agency Administrator
William D. Ruckelshaus today proposed standards intended
to reduce industrial emissions of inorganic arsenic,
a substance linked to human skin and lung cancer.

EPA estimates inorganic arsenic emissions from significant sources in the U.S. total 1,200 million grams per year. Over 85 percent of these emissions come from the following three source categories: The ASARCO copper smelter in Tacoma, Wash., emits about 282 million grams per year. Fourteen other copper smelters, using lower arsenic content ore, emit 738 million grams per year, and glass manufacturing plants are estimated to emit about 40 million grams annually. All three source categories are to be covered under today's proposal, which would remove approximately 200 million grams of arsenic a year.

While the agency estimates that the standards would reduce total arsenic emissions approximately 20 percent, it was noted that so-called fugitive emissions would be cut by about 65 percent. Fugitive arsenic emissions are those emissions not captured by control equipment to be vented through a stack. They are thought to be the emissions which pose the greatest risk to public health because they are released closer to ground level and have less chance of dispersing before reaching the public.

EPA had listed arsenic as a hazardous substance June 5, 1980, and had been ordered by a U.S. District Court in New York this January to publish a standard by July 11, 1983. Ruckelshaus said that while he could appreciate the concerns of the State of New York and the findings of the court, he nevertheless was disappointed that he did not have more time in which to consider other options to propose.

The standards proposed are open to debate and change. Other control options that are open to comment range from controls which might result in actual closure of the plants to different criteria for the setting of standards. Ruckelshaus stressed he is "eager to hear other suggested approaches to reducing arsenic emissions, including additional technical efforts industry can make."

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Under Section 112 of the Clean Air Act, a pollutant is listed as hazardous if EPA finds that it may cause or contribute to, in the Act's words, "an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness."

The listing was based on EPA findings that there is a high probability that inorganic arsenic is carcinogenic (cancer causing) to humans and that there is significant public exposure to the pollutant. Epidemiological studies linking inorganic arsenic to human skin and lung cancer had led the National Cancer Institute, the National Academy of Sciences, and the International Agency for Research and Cancer to conclude that there is strong evidence that the pollutant is carcinogenic to humans. The 1980 listing also signified EPA's intention to establish emission standards for inorganic arsenic under Section 112.

To date, EPA has also listed under Section 112 asbestos, beryllium, mercury, vinyl chloride, benzene and radionuclides as hazardous. Standards have been set for asbestos, beryllium, mercury and vinyl chloride, and standards proposed for the others.

EPA already controls arsenic under its water pollution, drinking water, pesticide and hazardous waste programs. The U.S. Occupational Safety and Health Administration also has rules protecting workers from occupational exposures to this pollutant.

The Clean Air Act calls for standards to be set "at the level which (in the Administrator's) judgment provides an ample margin of safety to protect the public health." Since inorganic arsenic, like most carcinogens, is believed by most scientists to present risks at any level of exposure, any emission will present some human health risk. EPA's policy toward such no-threshold pollutants is that sources of the pollutants should be controlled at least to a level that reflects the best control technology available that is economically attainable. EPA is proposing standards today that require the best available technology for controlling arsenic emissions.

Ruckelshaus pointed out that the 81-day public comment period would place heavy emphasis on the citizens of Tacoma. "I feel we must involve them directly because the risk we are describing there is high. In essence, the citizens will have an opportunity to share with EPA their reactions to managing the risks involved. We must ask them if they are willing to accept certain risks associated with exposures to low levels of arsenic," Ruckelshaus said.

The Administrator said he felt such efforts in Tacoma must include "more than public hearings. We must also work to educate them as to the health risks involved and the options available to EPA."

The proposed standards will appear in this week's Federal Register. The public comment period will run through Sept. 30. Two sets of public hearings are scheduled. The first will be held Aug. 23, 24 and 25 in Washington, D.C. The second, to be held in Tacoma Aug. 30 and 31, will address only the proposed standards for the ASARCO smelter in that city.

For information concerning the proposed standards, contact Robert L. Ajax, Standards Development Branch (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, N.C. 27711, telephone 919/541-5578. See attached fact sheet for more information.



Environmental Information

August 1983

The date for the Tacoma public hearing on EPA's proposed air pollution emission standards for arsenic from the ASARCO smelter, originally scheduled for August 30, has been changed. The new date:

9 a.m.
Wednesday, November 2
(and, if necessary, the same time on November 3)
Rotunda Room
Tacoma Bicentennial Pavillion
1313 Market Street
Tacoma

Because of the change, there has been an extension in the deadline for written comments on the EPA proposal to Saturday, December 10. Comments should be sent (in duplicate if possible) to this address:

Central Docket Section
U.S. Environmental Protection Agency
401 M Street SW
Washington, D.C. 20460

Persons commenting on the proposed standard for the ASARCO smelter in Tacoma are asked to put this notation on the front of the envelope: A-80-40.

It would also be helpful if persons who wish to present oral testimony at the November hearing in Tacoma would notify EPA of their intention by October 26. Please write Laurie Kral, Air Programs Branch (Mail Stop 532), U.S. Environmental Protection Agency, 1200 Sixth Avenue, Seattle 98101, or call her at 442-1089.

EPA has prepared three fact sheets which summarize EPA's proposal and the estimated health risks associated with the Tacoma smelter's arsenic emissions. These fact sheets are available at the following locations:

- Swasey, Mottet, Fern Hill, South Tacoma, Moore, McCormick, Kobetich, Municipal Reference and Main Branches of Tacoma Public Library
- Library, University of Puget Sound
- Lakewood and Peninsula Branches of the Pierce County Library
- Vashon Island Branch, King County Library
- Washington State Library, Olympia
- EPA Office of Public Affairs, 12th Floor, 1200 Sixth Avenue, Seattle

Anyone who needs more information than provided by the fact sheets is encouraged to review the documents from which they were derived. To make arrangements to see these documents, please write Dee Ann Kirkpatrick, Office of Public Affairs (Mail Stop 634), U.S. Environmental Protection Agency, 1200 Sixth Avenue, Seattle 98101, or call her at 442-1200

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OVERVIEW

- I WHAT WE KNOW ABOUT ARSENIC
- II WHAT WE KNOW ABOUT ARSENIC EMISSIONS
FROM TACOMA, WA SMELTER
- III ESTIMATES OF COMMUNITY EXPOSURE TO ARSENIC
AND ESTIMATED HEALTH RISKS
- IV CLEAN AIR ACT REQUIREMENTS
- V RISK MANAGEMENT AND THE STANDARD
SETTING PROCESS

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I WHAT WE KNOW ABOUT ARSENIC

- **HEALTH EFFECTS**
- **EPIDEMIOLOGY RESULTS**
- **ASSUMPTION OF NO EFFECTS THRESHOLD**
- **LINEAR MODEL RELATING EFFECTS AT HIGH EXPOSURE TO EFFECTS AT LOW EXPOSURE**
- **UNIT RISK NUMBER**

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INORGANIC ARSENIC AND HUMAN CANCER

INORGANIC ARSENIC HAS INDUCED CANCER IN:

SMELTER WORKERS - LUNG CANCER FROM BREATHING

TACOMA, WASHINGTON

ANACONDA, MONTANA

SAGANOSEKIMACHI, JAPAN

RONNSKAR, SWEDEN

PESTICIDE FACTORY WORKERS - LUNG CANCER FROM BREATHING

DOW PLANT

BRITAIN

BALTIMORE, MARYLAND

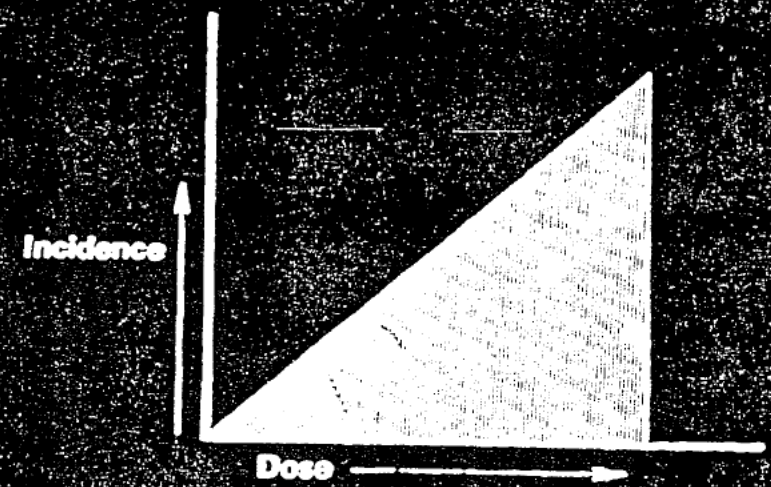
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BOUNDING CARCINOGEN RISK:
UPPER- BOUND, LOWER - BOUND APPROACHING ZERO



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ADMINISTRATIVE REMOVAL

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CALCULATION OF ABSOLUTE RISK FOR ASARCO WORKERS

| <u>Cumulative Exposure*</u> <u>(ug/m³ - Years)</u> | <u>Respiratory Cancer Cases</u> | | | <u>Person - Years</u> <u>of Observation</u> | <u>Absolute</u> <u>Risk</u> <u>(x 1000)</u> |
|--|---------------------------------|-----------------|-------------------------------|--|---|
| | <u>Observed</u> | <u>Expected</u> | <u>Excess</u> <u>Cases</u> | | |
| 20 | 8 | 4 | 4 | 10,902 | 0.37 |
| 58 | 18 | 11 | 7 | 21,642 | 0.32 |
| 145 | 21 | 10.3 | 10.7 | 14,623 | 0.73 |
| 304 | 26 | 14.1 | 11.9 | 13,898 | 0.86 |
| 900 | 31 | 12.7 | 18.3 | 9,398 | 1.95 |

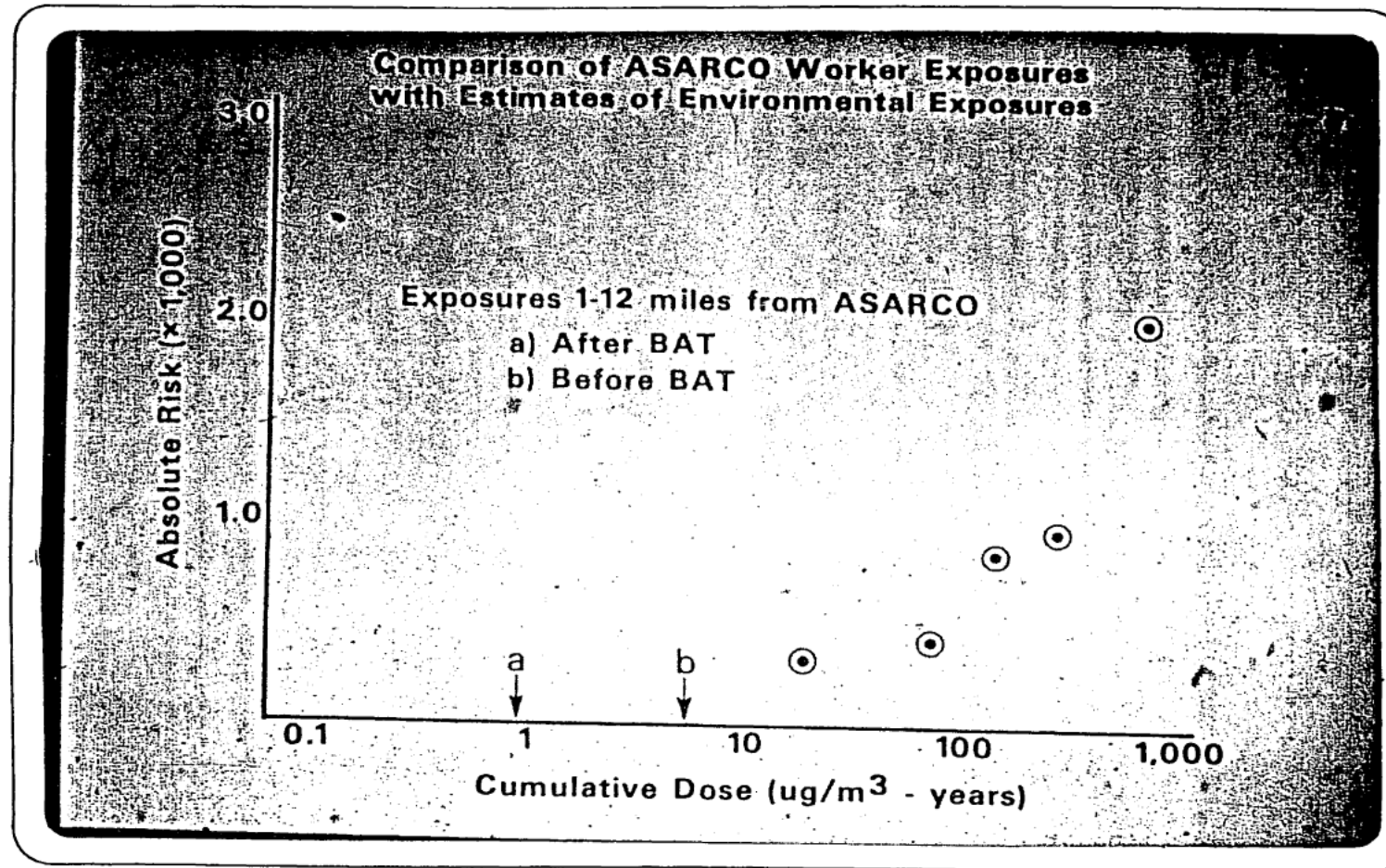
*Adjusted to a continuous lifetime basis.

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1134



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RISK TO COMMUNITY AFTER CONTROLS AS COMPARED TO OTHER RISK

| <u>RISKS TAKEN IN EVERY DAY LIFE</u> | <u>UPPER-BOUND RISK DUE TO ASARCO AFTER CONTROLS</u> | <u>OTHER ENVIRONMENTAL UPPER-BOUND RISKS AFTER CONTROLS</u> |
|--|---|---|
| NORMAL RISK DUE TO CANCER 1/5 | HIGHEST EXPOSED GROUP (1300) 4/1000 | VINYL CHLORIDE 1/100,000 |
| 1 PACK CIGARETTES PER DAY 1/10 | WITHIN A 12 MILE RADIUS (EXCEPTING THE HIGHEST EXPOSURE GROUP) 1.5/100,000 | BENZENE 1/100,000 |
| TRAFFIC ACCIDENTS 2/100 | | HALOFORMS IN DRINKING WATER 1/10,000 |
| SIX PACK DIET SODA PER DAY 1/1000 | | |

1836

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OVERVIEW

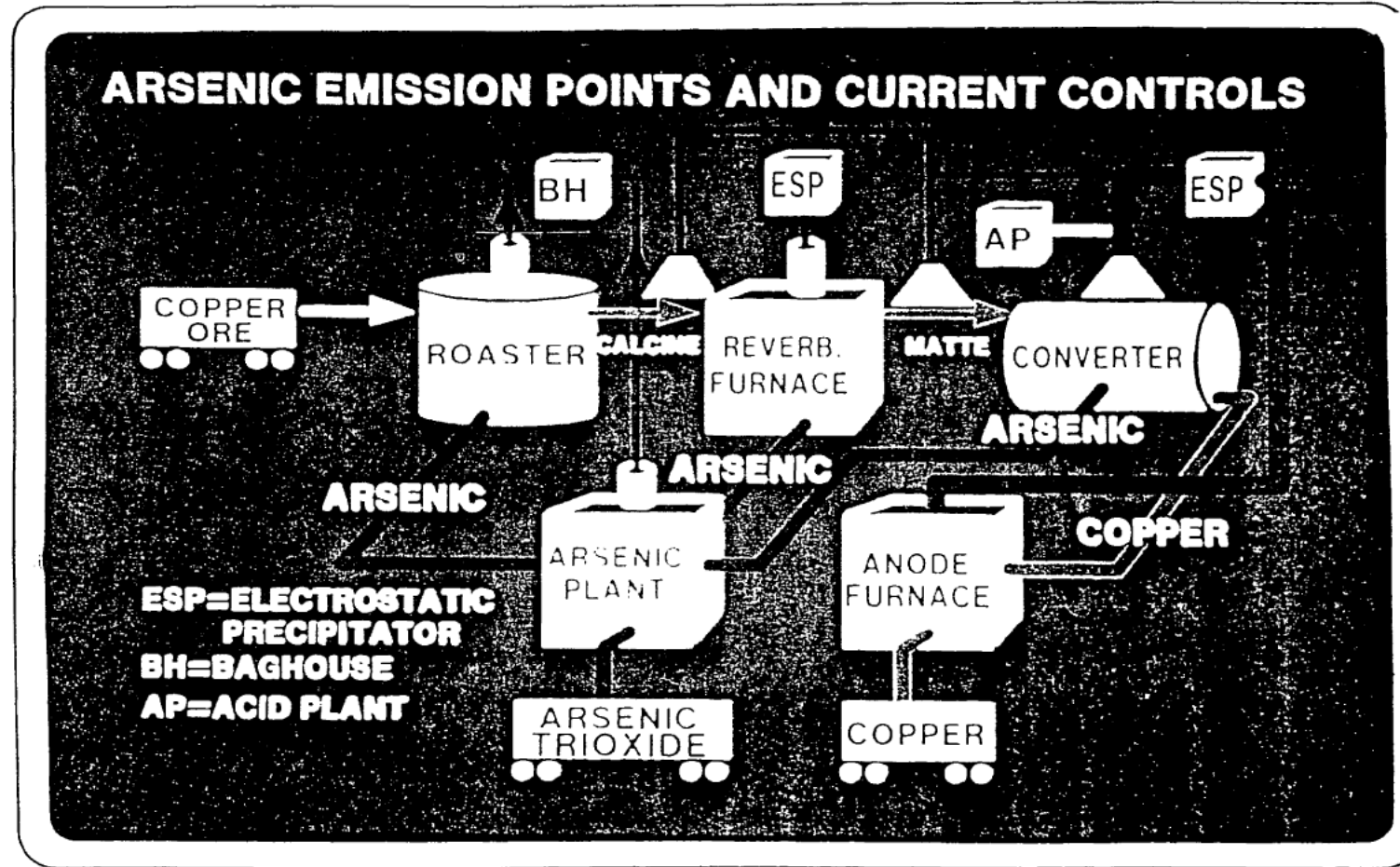
- I WHAT WE KNOW ABOUT ARSENIC**
- II WHAT WE KNOW ABOUT ARSENIC EMISSIONS
FROM TACOMA, WA SMELTER**
- III ESTIMATES OF COMMUNITY EXPOSURE TO ARSENIC
AND ESTIMATED HEALTH RISKS**
- IV CLEAN AIR ACT REQUIREMENTS**
- V RISK MANAGEMENT AND THE STANDARD
SETTING PROCESS**

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1838

10/54

ARSENIC EMISSION RATES TACOMA, WA, SMELTER

| EMISSION SOURCE | EMISSIONS, tons/yr | | |
|------------------------|--------------------|------------|-----------------------|
| | POTENTIAL | CURRENT | W/ADDITIONAL CONTROLS |
| ROASTERS | 2415 | 4 | 4 |
| REVERBERATORY FURNACES | 5790 | 95 | 95 |
| CONVERTERS | 1021 | 132 | 11 |
| ANODE FURNACE | 5 | 1 | 1 |
| ARSENIC PLANT | 3588 | 75 | 75 |
| FLUE DUST HANDLING | 26 | 3 | 3 |
| TOTAL | 12,845 | 310 | 189 |

1837

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11/31

ARSENIC EMISSION RATES TACOMA, WA, SMELTER

| EMISSION SOURCE | EMISSIONS, tons/yr | | |
|------------------------|--------------------|------------|-----------------------|
| | POTENTIAL | CURRENT | W/ADDITIONAL CONTROLS |
| ROASTERS | 2415 | 4 | 4 |
| REVERBERATORY FURNACES | 5790 | 95 | 95 |
| CONVERTERS | 1021 | 132 | 11 |
| ANODE FURNACE | 5 | 1 | 1 |
| ARSENIC PLANT | 3588 | 75 | 75 |
| FLUE DUST HANDLING | 26 | 3 | 3 |
| TOTAL | 12,845 | 310 | 189 |

1840

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12/31

ARSENIC EMISSIONS - STACK VS. FUGITIVE

| | EMISSIONS, tons/yr | |
|------------------|--------------------|-------------------|
| | CURRENT | W/ADD'NL CONTROLS |
| STACK: | | |
| ROASTERS | 4 | |
| REVERB. FURNACES | 90 | |
| CONVERTERS | <1 | |
| ANODE FURNACE | <1 | |
| ARSENIC PLANT | 69 | |
| | 163 | 163 |
| FUGITIVE: | | |
| CONVERTERS | | 11 |
| ROASTERS | <1 | |
| REVERB. FURNACES | 5 | |
| ANODE FURNACE | 1 | |
| ARSENIC PLANT | 6 | |
| FLUE DUST HDLING | 3 | |
| | 15 | 15 |
| TOTAL: | 310 | 189 |

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1841

OVERVIEW

- I WHAT WE KNOW ABOUT ARSENIC**
- II WHAT WE KNOW ABOUT ARSENIC EMISSIONS
FROM TACOMA, WA SMELTER**
- III ESTIMATES OF COMMUNITY EXPOSURE TO ARSENIC
AND ESTIMATED HEALTH RISKS**
- IV CLEAN AIR ACT REQUIREMENTS**
- V RISK MANAGEMENT AND THE STANDARD
SETTING PROCESS**

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1842

ESTIMATED UPPER-BOUND RISK FOR POPULATIONS NEAR ASARCO

| <u>POPULATION EXPOSED</u> | <u>UPPER-BOUND INDIVIDUAL LIFE-TIME RISK</u> | | <u>ANNUAL INCIDENCE (CASES PER YEAR)</u> | |
|--|--|---------------------------|--|---------------------------|
| | <u>BEFORE CONTROLS</u> | <u>AFTER CONTROLS</u> | <u>BEFORE CONTROLS</u> | <u>AFTER CONTROLS</u> |
| HIGHEST EXPOSED GROUP (1300) | 23/1000 | 4/1000 | 0.4 | 0.08 |
| PEOPLE WITHIN A 12 MILE RADIUS (370,000) (EXCEPTING HIGHEST EXPOSED GROUP) | 9/100,000 | 1.5/100,000 | 4.1 | 0.7 |

1843

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ESTIMATING EXPOSURE



POOR DISPERSION



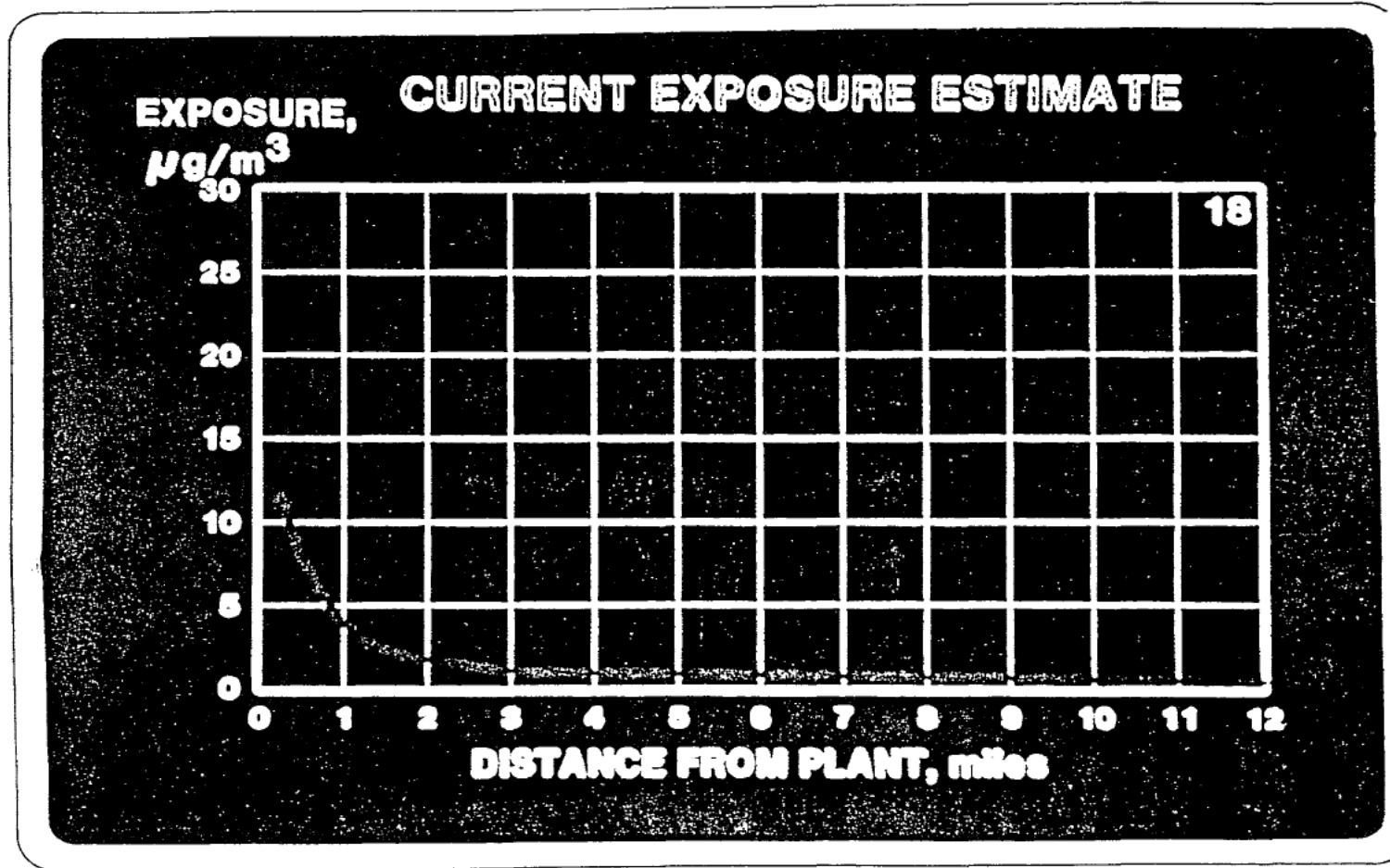
GOOD DISPERSION

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1844

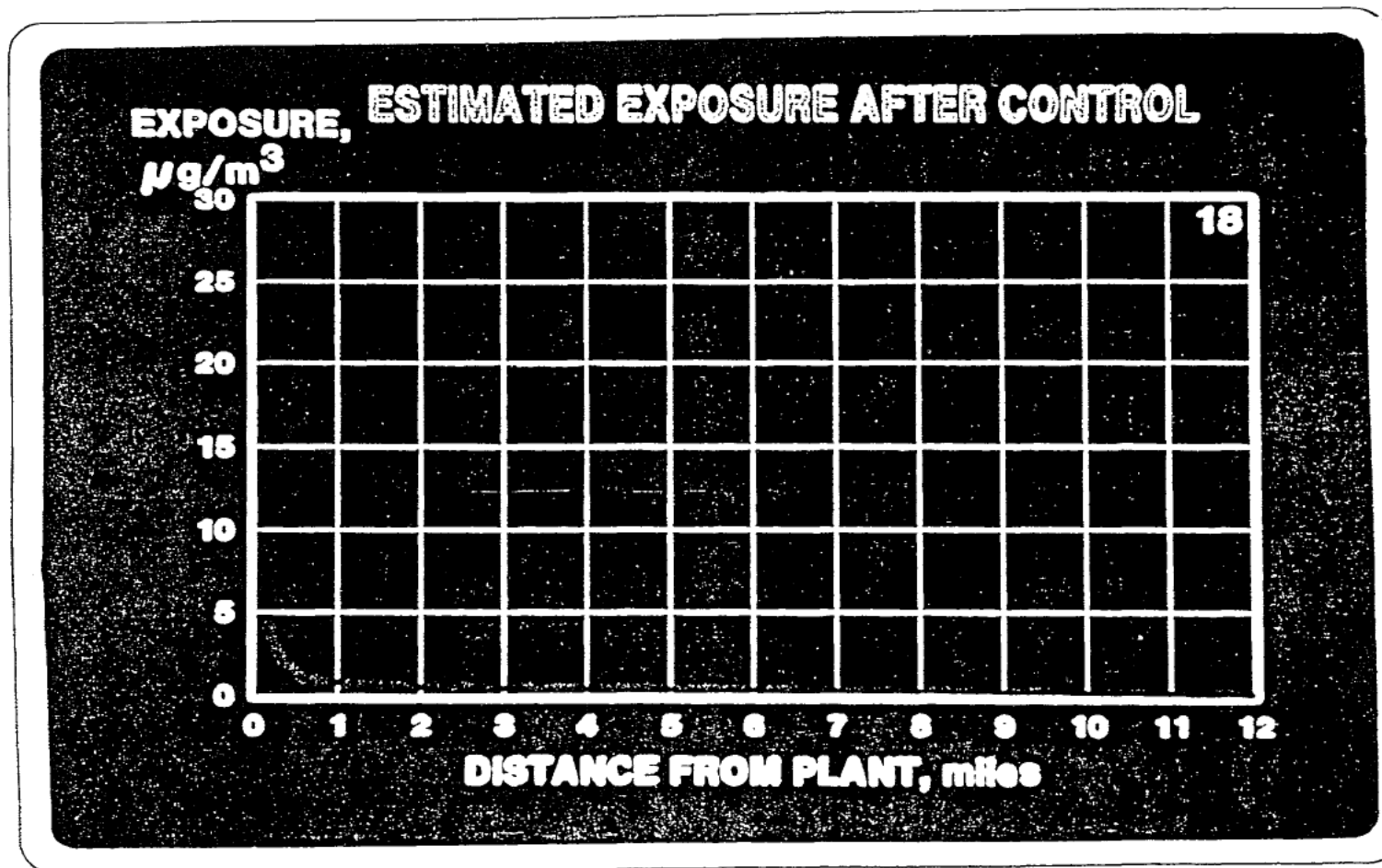


1845

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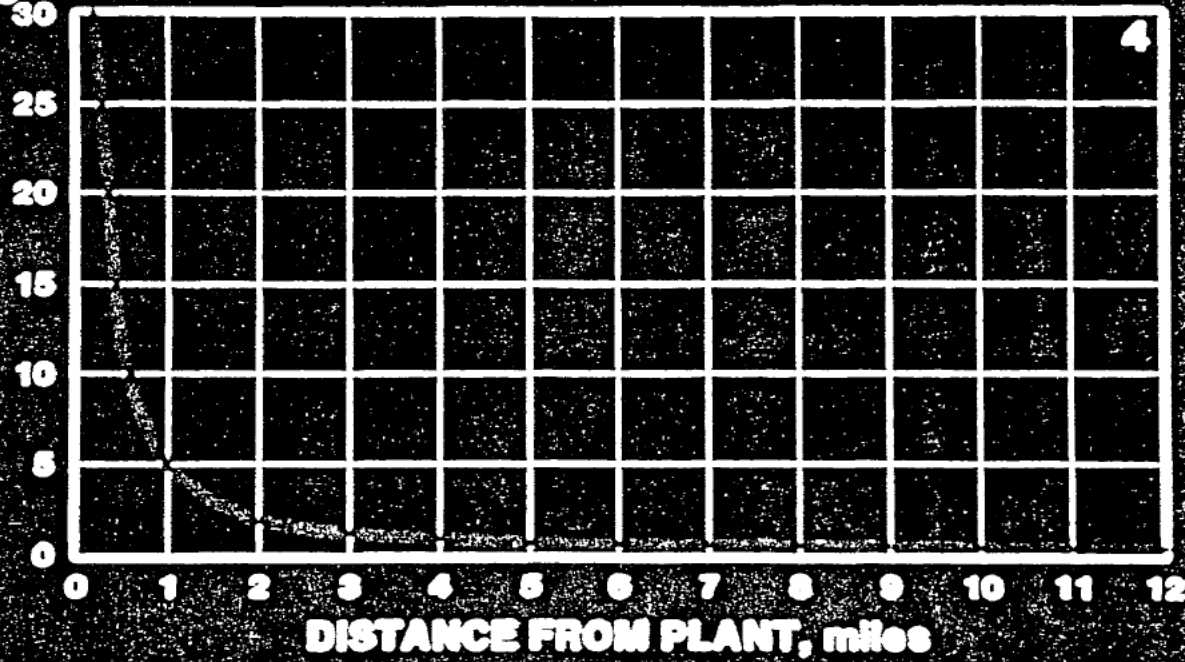
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1846

EXPOSURE, $\mu\text{g}/\text{m}^3$ CURRENT EXPOSURE ESTIMATE



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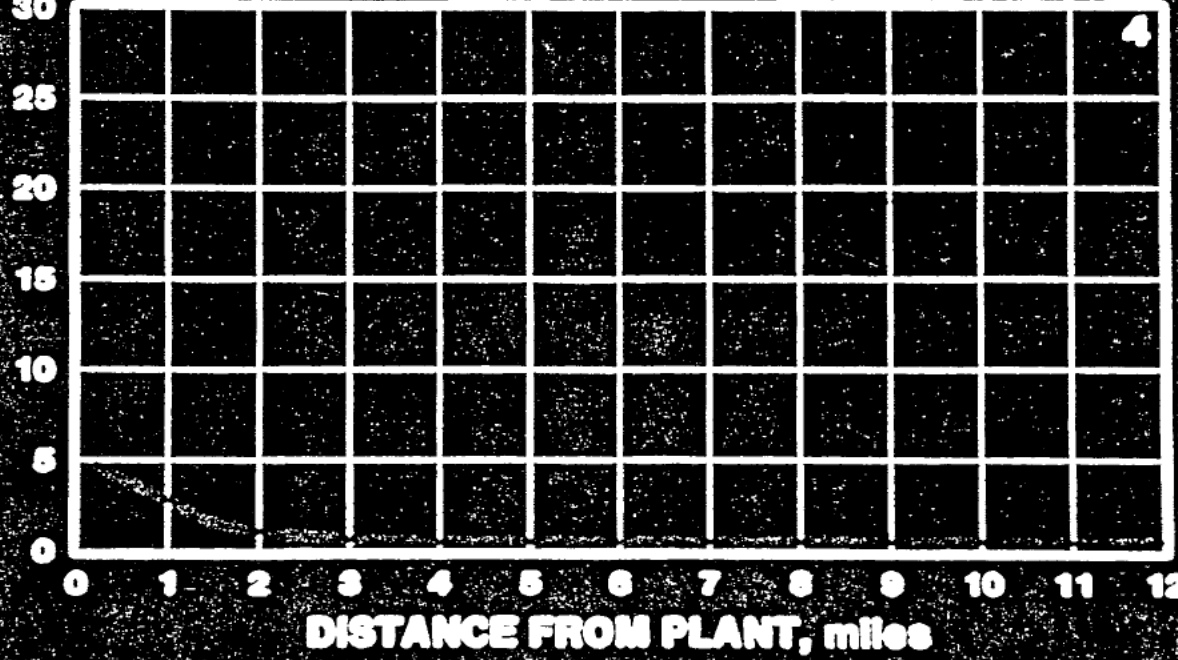
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1847

19/31

EXPOSURE, ESTIMATED EXPOSURE AFTER CONTROL
 $\mu\text{g}/\text{m}^3$



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1848

LIFETIME RISK

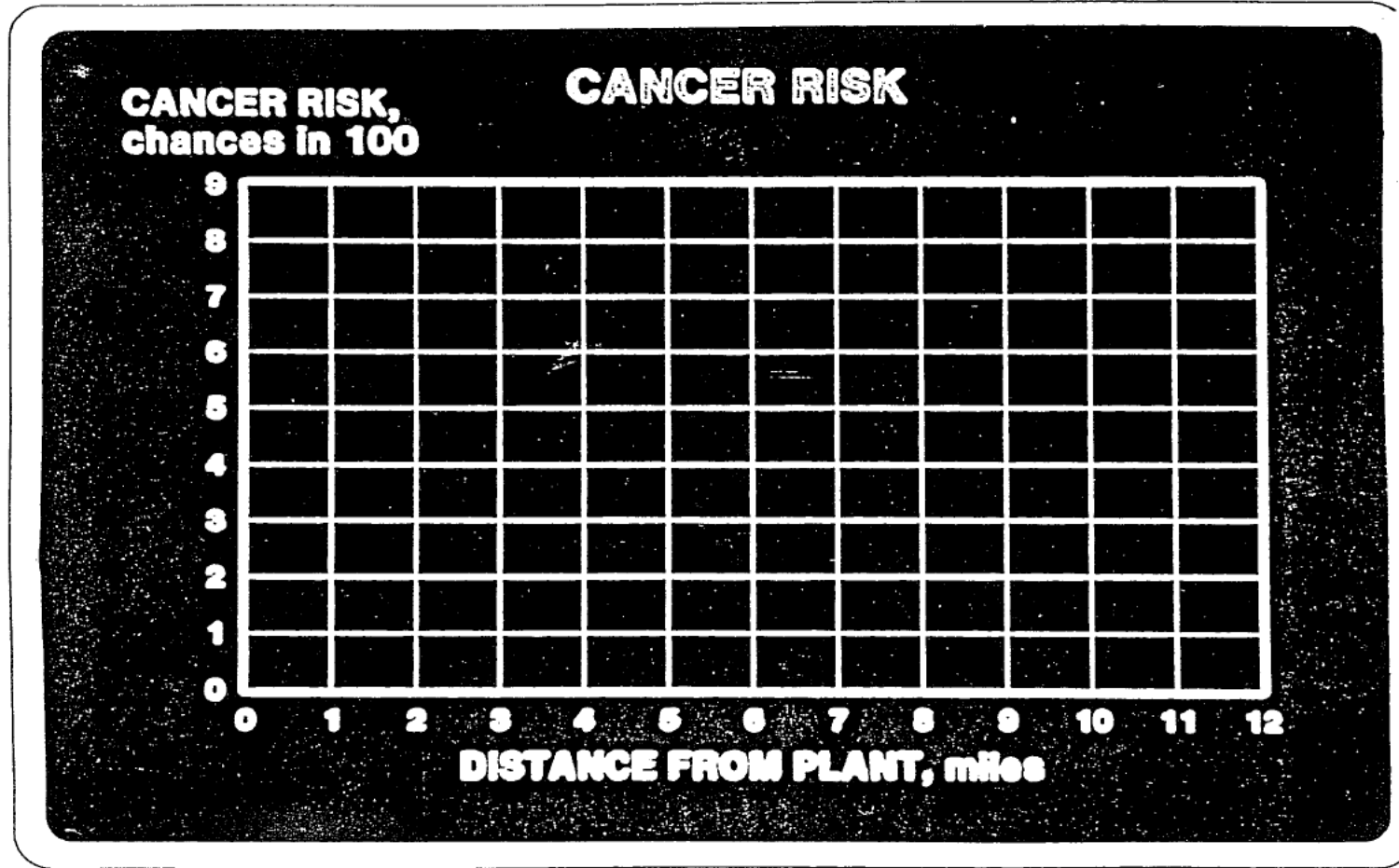
**THE "LIFETIME RISK" IS THE
CHANCE OF GETTING LUNG CANCER IF ONE
WERE TO BREATHE AIR CONTAINING
AN ESTIMATED CONCENTRATION OF
INORGANIC ARSENIC CONTINUOUSLY FOR
70 YEARS.**

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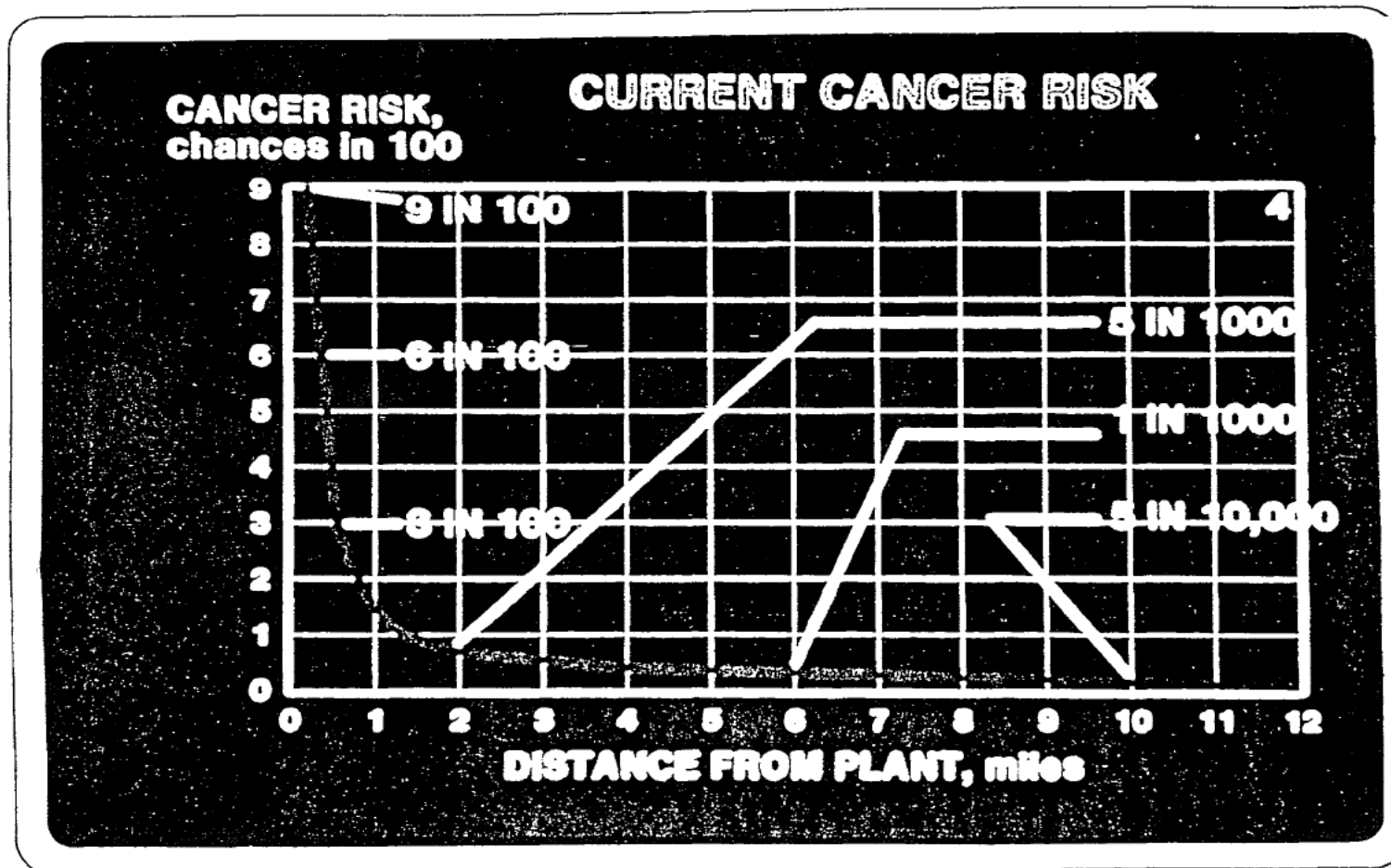


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1850

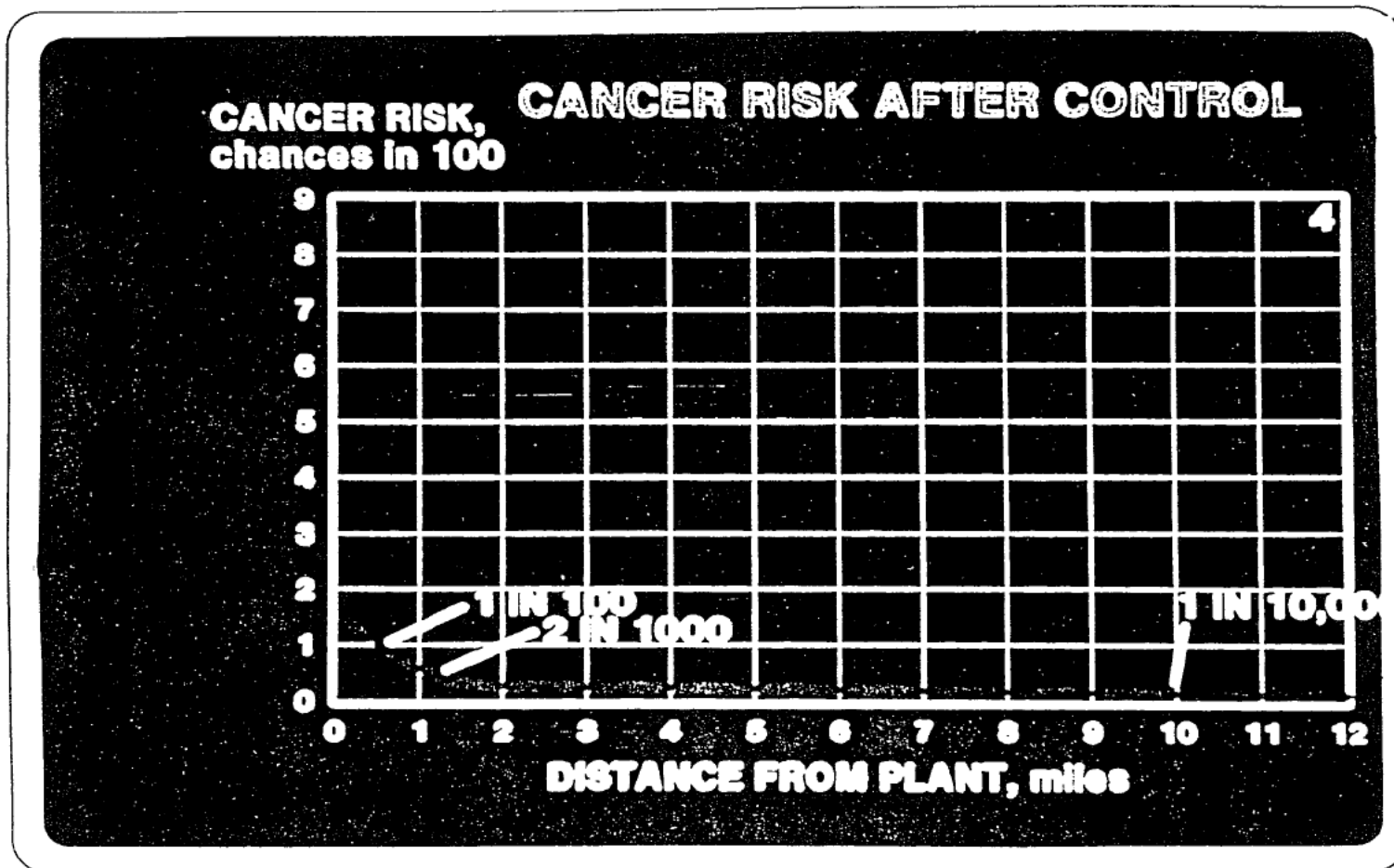


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1851

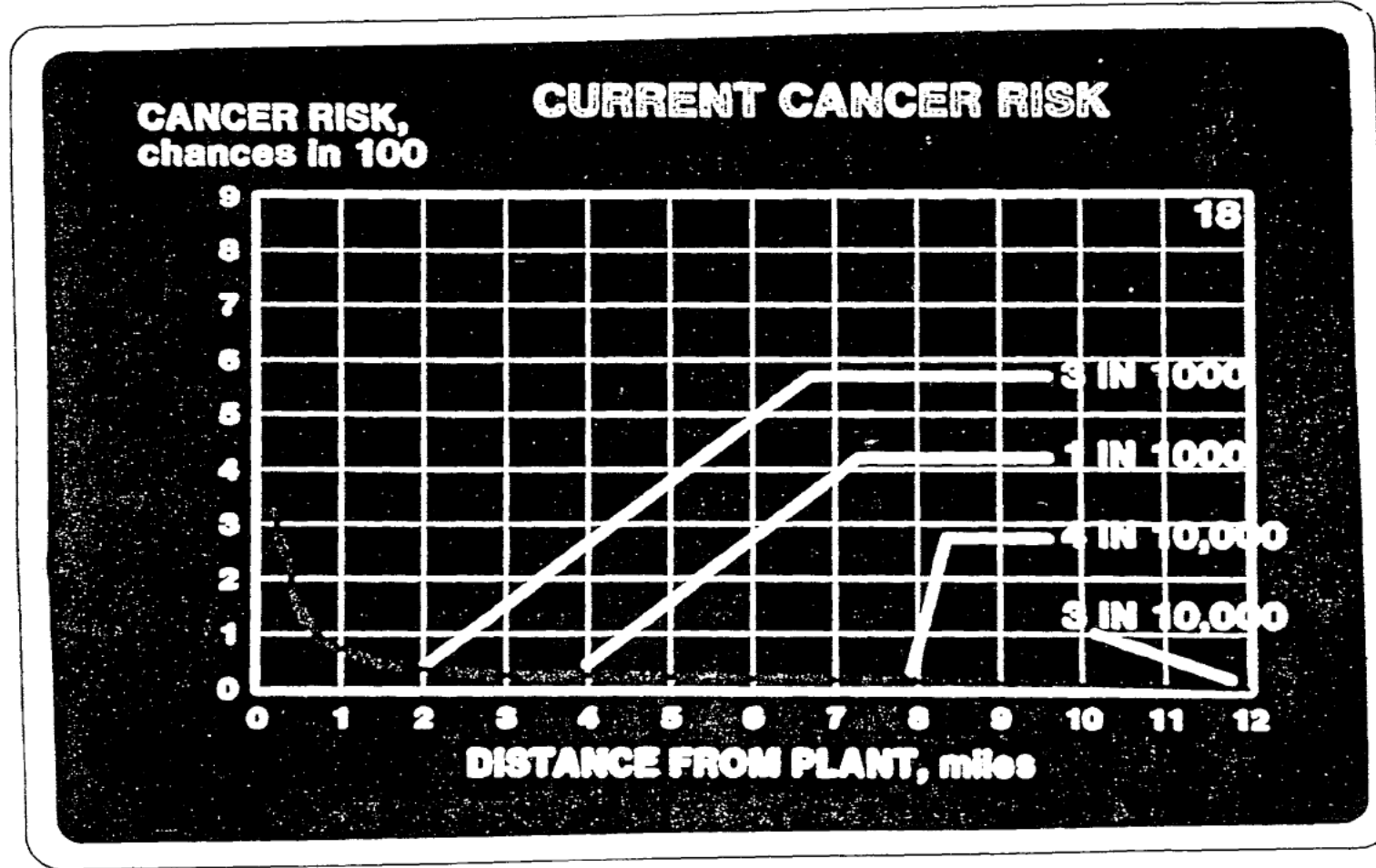


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1852



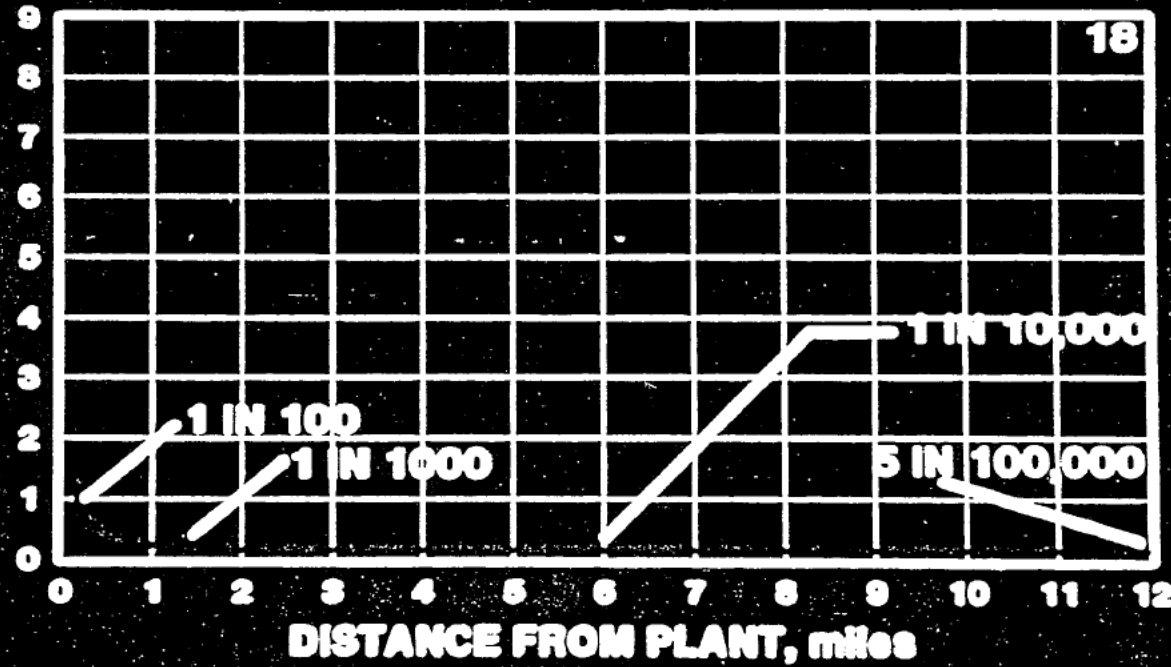
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1853

CANCER RISK, chances in 100 **CANCER RISK AFTER CONTROL**



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1854

**○ UNCERTAINTIES IN EXPOSURE AND
RISK ESTIMATES**

■ ASSUMPTION OF NO RISK THRESHOLD

**■ ASSUMPTION THAT EFFECTS AT LOW
ARSENIC CONCENTRATIONS ARE
DIRECTLY PROPORTIONAL TO
EFFECTS AT HIGH CONCENTRATIONS**

**■ ASSUMPTION OF CONSTANT EXPOSURE
FOR 70 YEARS**

■ IMPRECISE EMISSION ESTIMATES

■ IMPRECISE DISPERSION MODELS

■ OTHER POLLUTANTS NOT CONSIDERED

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1855

OVERVIEW

- I WHAT WE KNOW ABOUT ARSENIC**
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AND ESTIMATED HEALTH RISKS**
- IV CLEAN AIR ACT REQUIREMENTS**
- V RISK MANAGEMENT AND THE STANDARD
SETTING PROCESS**

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1856

IV CLEAN AIR ACT REQUIREMENT

SECTION 112 OF THE CLEAN AIR ACT OF 1977 REQUIRES:

**"THE ADMINISTRATOR SHALL ESTABLISH ANY
SUCH STANDARD AT THE LEVEL WHICH
IN HIS JUDGMENT PROVIDES AN AMPLE
MARGIN OF SAFETY TO PROTECT THE
PUBLIC HEALTH FROM SUCH HAZARDOUS
AIR POLLUTANT."**

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1857

OVERVIEW

- I WHAT WE KNOW ABOUT ARSENIC**
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- V RISK MANAGEMENT AND THE STANDARD
SETTING PROCESS**

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1858

THE RISK MANAGEMENT APPROACH

- **APPLY BEST AVAILABLE TECHNOLOGY
AS A MINIMUM**
- **DETERMINE THE NEED FOR FURTHER
EMISSION REDUCTION BY CONSIDERING
THE REMAINING ESTIMATED RISKS, THE
STEPS WHICH CAN BE TAKEN TO FURTHER
REDUCE THESE RISKS, AND THE IMPACTS
(COST, COMMUNITY DISRUPTION, LOSS
OF JOBS) OF DOING SO**

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1859

EPA PROPOSAL

- **BEST AVAILABLE TECHNOLOGY (BAT)**
- **PUBLIC EDUCATION AND INVOLVEMENT**
- **CONSIDERATION OF ALTERNATE
CONTROL MEASURES**
- **IMPROVED MODELING AND EXPOSURE
ESTIMATES**
- **PUBLIC COMMENT**



FINAL DECISION

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186

Dana Davoli
U. S. EPA, Region 10
1200 Sixth Avenue
Seattle, WA 98101

RECEIVED

AUG 15 1983

August 12, 1983

AIR PROGRAMS BRANCH

Dear Ms. Davoli

As we discussed in our telephone conversation Friday, I am seeking EPA support for research designed to study people's responses to the proposed arsenic emission standards. If you like, I will be glad to send you a more detailed description of the proposed research or meet with you to discuss it in person sometime in the near future. For the present, I hope it will suffice to briefly state the goals of the research and include a copy of the questionnaire that would be used.

The proposed research would have three main goals: 1. To obtain organized information about the opinions of people attending the hearing. 2. To identify factors other than the numerical risk estimates and technical details of the proposed standards which may influence how people respond to the risks and standards. 3. To study the hearing process, and the use of questionnaires as means of obtaining public input into regulatory decisions.

The basic method of the study is relatively simple; involving distribution of questionnaires at the Nov. 2nd. hearings, with a request that people complete the questionnaire while at the hearings and deposit the completed forms in collection boxes which would be provided at the entrances. Because it is likely to be crowded and busy at the hearings, and since there may be other groups or individuals distributing handouts, the most successful method of distributing the questionnaire to everyone in attendance would probably require placement of officially designated persons at each of the entrances to the room where the hearing will be held. If people are not located there and given some official designation and identification, it seems likely that many of those attending would be missed and or would refuse to accept a questionnaire from whomever distributes them. To collect the questionnaires, large and easily identified receptacles would need to be placed in visible locations at each exit.

Considering the need to distribute the questionnaires at the entrances and collect them at the exits, I hope to be able to work closely with the EPA personnel responsible for the logistics of the hearings to devise and implement efficient and acceptable procedures. In asking for support from EPA, I am primarily asking for permission to distribute and collect the questionnaires in the manner described. I would also appreciate any assistance the agency might provide in the way of people to distribute the material. This is not absolutely essential, but to be frank it would be difficult for me to arrange for enough people to adequately cover all of the entrances for the entire length of the hearing.

Following the hearing, I intend to make a concerted effort to score the questionnaires and perform statistical analyses of the data as quickly as possible. My goal in this would be to have the results available in time for the EPA to consider them, if it wished, while making a decision regarding an emission standard. I must acknowledge however that, as I am sure the EPA is only too well aware, there will be relatively little time between the date of the hearing and the required decision date. Past experience has taught me that data analyses can often take much longer than anticipated, so, though I

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would make every reasonable effort to have the data available to the EPA, I could not promise with certainty that it would be ready in time to be of use prior to the decision.

Just as the manner in which the EPA is seeking public involvement in the standard setting process is unprecedented in this context, the proposed research is unprecedented in the social scientific study of responses to risks. Although studies of how people respond to environmental risks are increasing in number, no research to date has examined responses to risks of this type, or in a situation of this type, in which the opinions of the people being studied may influence the levels of risk they will face in the future. Considering the significance of this hearing for the EPA and the citizens of Tacoma, and in view of the unique contribution which this study can make to our knowledge of how people respond to risks and environmental protection standards in general, it seems the proposed research is well justified on its own merits, even though there may be a chance that the data will not be ready in time to be of use in making this specific decision.

I recently discussed this proposal with Dr. Nicola and Peggy Kopf of the Tacoma Pierce County Health Department. In addition to offering a number of helpful suggestions, both expressed interest in the study and agreed to support it. I hope your agency will also find the study worthy of support.

As I mentioned at the outset, I have enclosed a copy of the questionnaire I would like to distribute at the hearing. Previous versions have been administered to a group of high school students and to personal acquaintances who provided comments about the structure, wording, length and other important characteristics. Dr. Nicola and Peggy Kopf have also examined an earlier version of the questionnaire and offered useful comments which are reflected in the present draft. If you have any suggestions for further improvements or if you have any questions about the purpose or wording of items please let me know. I would also be glad to try to incorporate questions that might be of specific interest to your agency, but I should note that it may be difficult to add items without making the questionnaire so long that people do not complete it.

Thank you for considering this proposal, and I hope we will be able to work together on the research. If you have any questions, or if you would like to discuss the research in person, please contact me.

Sincerely,

(b) (6)

Tacoma WA
98407

(b) (6)

ARSENIC EMISSION STANDARDS QUESTIONNAIRE

You have been given this questionnaire as part of a study sponsored by the Tacoma-Pierce County Health Department. The purpose of this study is to help us better understand what you think about the proposed arsenic emission standards and other related issues. It does not take much time to answer the questions, and your responses will be completely confidential. Please complete the questionnaire while you are at the hearing today and drop it in one of the boxes by the door as you leave. Your opinions are important to us.

1. How many years have you lived in the Tacoma - Puget Sound area? ____ years
2. How close is your present home to the smelter? (If it is less than one mile please estimate as a fraction of a mile, for example 1/2 or 1/4.) ____ miles.
3. What direction do you live from the smelter? Please pick the direction that best tells how you would get from the smelter to your home if you could go in a straight line.
 north ____ northeast ____ east ____ northwest ____
 south ____ southeast ____ west ____ southwest ____
4. How many years have you lived at your present address? ____ years
5. Do you feel the ASARCO smelter is a health hazard to you personally?
 Yes ____ No ____ Don't Know ____
6. In your opinion, do the EPA's proposed standards for arsenic provide an ample margin of safety to protect the public health?
 Yes ____ No ____ Don't Know ____
7. Would you favor stronger controls than the EPA has proposed?
 Yes ____ No ____ Don't Know ____
8. Would you favor stronger controls than the EPA has proposed even if it means the smelter would have to close and eliminate jobs?
 Yes ____ No ____ Don't Know ____
9. What percentage of the population of the Tacoma - Puget Sound area do you think would agree with your answers to the questions above? ____ %
11. On a scale of 1 to 7, how accurate do you think the EPA estimates of the risks from arsenic are?
 (For questions like this please show your opinion by circling a number on the scale which is closest to a statement you agree with) The EPA risk estimates are:
 very inaccurate moderately accurate very accurate
 1 2 3 4 5 6 7
12. Do you think the real risks from the smelter's arsenic are higher, lower, or equal to the EPA estimates? (Please circle the number is closest to the statement you agree with) The real risks from arsenic are:
 very much lower about the same very much higher
 than EPA says as EPA says than EPA says
 1 2 3 4 5 6 7

(Please turn this page over and answer the questions on the back)

13. Compared to the amount of risk EPA estimates say would be allowed, how much risk do you think should be allowed by the arsenic standards?

| | | | | |
|--|---|--|---|--|
| very much less risk should be allowed than EPA would | | about the same risk should be allowed as EPA would | | very much more risk should be allowed than EPA would |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

14. Considering all of the benefits and all of the harmful effects of the smelter, how do you think the overall benefits compare with the overall harm to the community?

| | | | | |
|---|---|--------------------------|---|---|
| The harm is much greater than the benefit | | The effects are equal | | The benefit is much greater than the harm |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

The items below are not all specifically about the smelter or the proposed arsenic standards, but they will help us to understand how you feel about these kinds of issues in general. Please circle one of the numbers below each statement to show how much you agree or disagree with that statement.

15. "Pollution control laws should not require industries to do more than is possible with the best available technology."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

16. "If the government did not pass tough laws, industries would not do enough to control pollution on their own."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

17. "Most pollution controls cost more than they are worth to our society."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

18. "The natural resources of the Earth are being destroyed and used too fast."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

19. "Anyone who wants can choose whether or not to be exposed to emissions from the ASARCO smelter."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

20. "People who can choose whether or not to be exposed to risks should be allowed to take greater risks than people who don't have a choice."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

21. "Government agencies should not wait for absolute proof that something is harmful. If there is any evidence at all that something might be harmful, the government should act to protect the public."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

22. "I am absolutely certain I will not get cancer caused by chemicals, pesticides, or any other form of environmental pollution."

| | | | | |
|-------------------|---|---------|---|----------------|
| Strongly Disagree | | Neutral | | Strongly Agree |
| 1 | 2 | 3 | 4 | 5 |
| | | | | 6 |
| | | | | 7 |

1975

THANK YOU

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1866

VASHON ISLAND REQUESTS 8/10/83

FOR FEDERAL REGISTERS

DOCUMENT NO. 4791X

Sent 8/12/83
Lkml

(b) (6)
Vashon, WA 98070

(b) (6)
(b) (6)
Burton, WA 98013

(b) (6)
Vashon, WA 98070

(b) (6)
(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Burton, WA 98013

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

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1867

(b) (6)
c/o UPS Law School
950 Broadway
Tacoma, WA 98402

(b) (6)
c/o Seattle Times
P.O. Box 70
Seattle, WA

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Vashon, WA 98070

(b) (6)
Olympia, WA 98502

(b) (6)
Vashon, WA 98070

(b) (6)
Tacoma, WA 98407

(b) (6)
Burton, WA 98013

(b) (6)
Dockton, WA 98070

(b) (6)
Burton, WA 98913

(b) (6)
Vashon, WA 98070

VAS ISL REQUESTS 2/15

ORDER FORM: FEDERAL REGISTER
July 20, 1983

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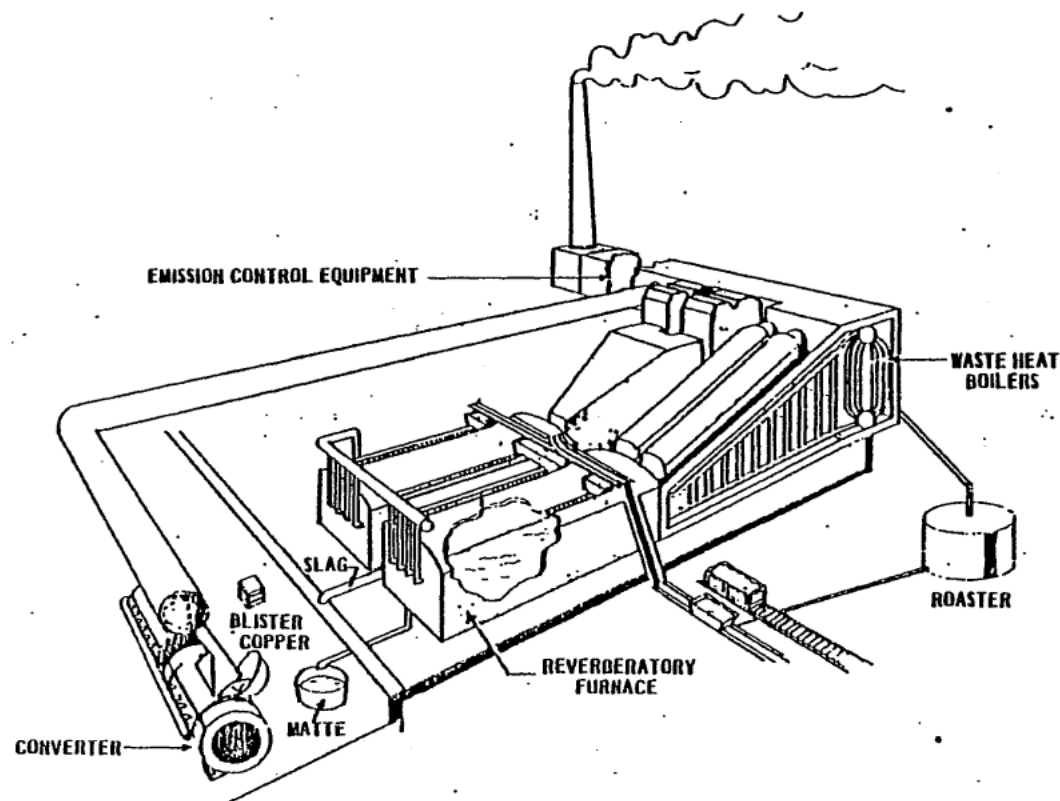
V. J. Shon

Source Risk Policy Paper

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*13/1/83
93-72*



Primary Copper Smelter

016-985

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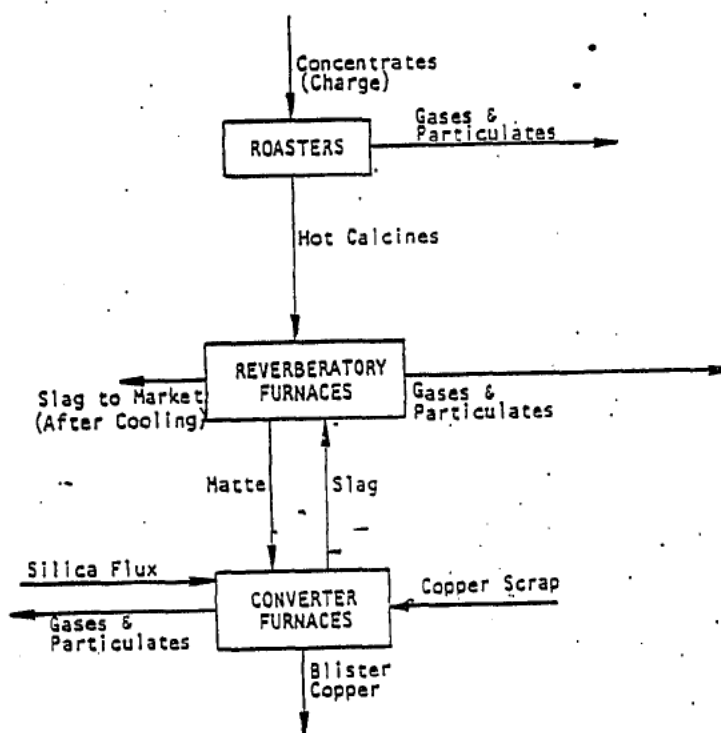
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BASIC SMELTING PROCESS USED AT THE TACOMA SMELTER

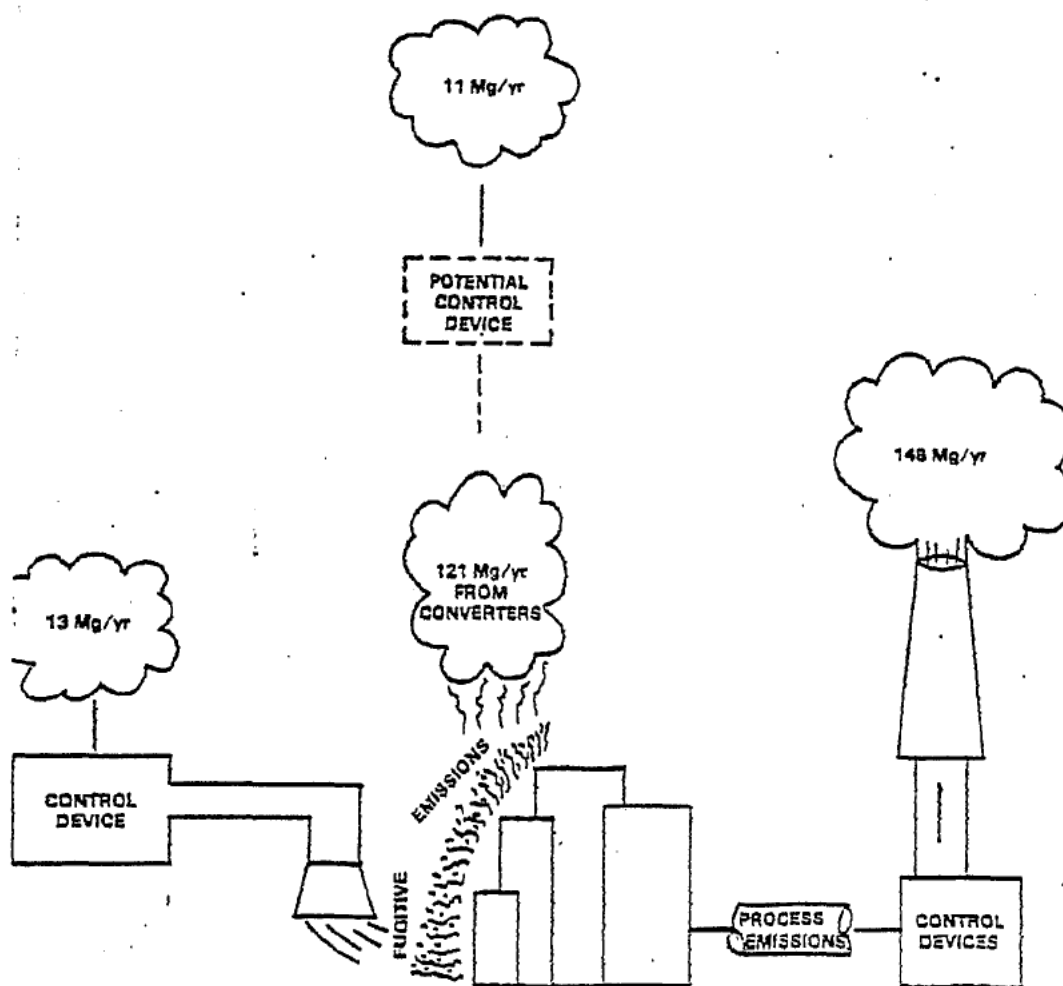
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EMISSIONS FROM ASARCO/TACOMA

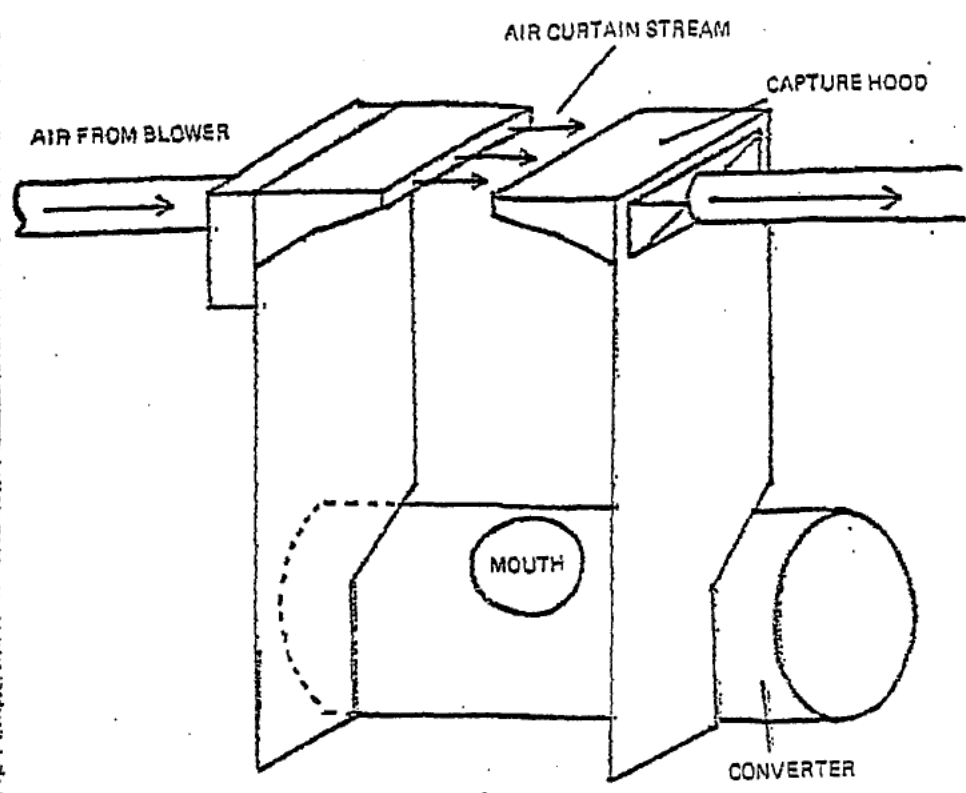


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CONVERTER FIXED ENCLOSURE/AIR CURTAIN (OPEN)

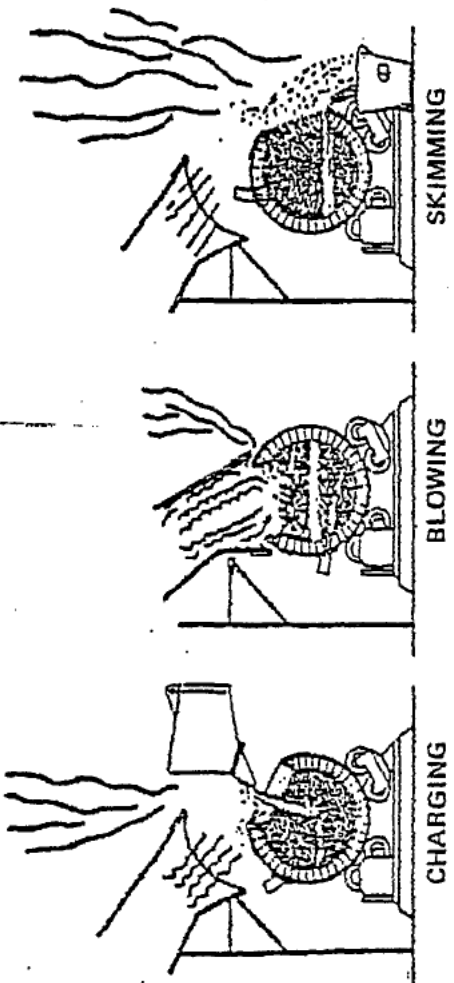
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COPPER CONVERTER OPERATIONS



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News Release

83-51

Contact: Bob Jacobson
(206) 442-1203

July 12, 1983



FOR RELEASE AFTER 1 P.M. (PDT), TUESDAY, JULY 12

Today's proposal by the U.S. Environmental Protection Agency to curtail emissions of inorganic arsenic at the ASARCO smelter in Tacoma triggers a comment period during which the public will have an important role in determining exactly what level of pollution controls will provide "an ample margin of safety to protect public health," according to Ernesta B. Barnes, EPA's Northwest regional administrator.

"That phrase -- 'an ample margin of safety' -- is the critical issue in the upcoming public comment period on the EPA proposal," Barnes said. "In making the proposal, EPA is openly acknowledging that our proposed controls for ASARCO will not eliminate risks to health, but will only reduce them.

"The question facing citizens affected by the ASARCO arsenic emissions is whether the reduced health risk is acceptable."

Inorganic arsenic is a probable carcinogen, said Barnes, and therefore can be assumed to present risks at any level of exposure. There is no defined threshold at which risks begin to occur. EPA's policy toward such non-threshold pollutants is that -- as a minimum requirement -- their emissions be reduced by the best control technology available.

(more)

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Barnes also said that EPA will go beyond that minimum criterion of "best available control technology" if necessary to prevent an unreasonable risk to public health.

"During the upcoming public comment period, EPA is encouraging people within the 12.5 mile radius of the smelter to help decide what is an 'acceptable' or 'reasonable' health risk," Barnes said. "In addition, EPA will be soliciting the comments of knowledgeable parties -- ASARCO officials and employees, the engineering community, State and local air pollution control agencies -- who are in the best position to tell EPA whether our proposal does, indeed, represent the best available control technology."

The EPA proposal calls for ASARCO to place hoods on the converters used in the smelting process, a move that would cost ASARCO an estimated \$3.5 million in installation costs and an estimated annual operating cost of \$1.5 million. Use of the hoods is expected to reduce ASARCO's annual emissions of inorganic arsenic from 310 tons to 189 tons.

"Does that requirement constitute the very best control technology available to ASARCO? -- that's what we want to learn during the comment period," Barnes said. "Are there other operations or practices at the smelter where further controls can be employed to reduce emissions of inorganic arsenic?"

Barnes added that ASARCO's ongoing emissions of inorganic arsenic may be only part of the public health risks faced by people living downwind from the smelter.

"Public health officials are concerned by the deposits of arsenic over the years," Barnes said. "Even with future decreases in the amount of arsenic from ASARCO, arsenic concentrations in the soil surrounding the smelter will remain high."

Barnes said the public hearing on EPA's proposal will be held from noon to 10 p.m. on Tuesday, August 30, in the Rotunda Room of the Tacoma Bicentennial Pavillion at 1313 Market Street.. A second day of hearings will be held, if necessary, at the same location on the following day.

Between now and then, Barnes said EPA will conduct public workshops, probably in early August, to acquaint people in Tacoma and nearby Vashon and Maury Islands with details of the EPA proposal and to help them prepare testimony for the hearing. Times and places for the workshop will be announced as soon as arrangements are made.

More information about the hearings and the workshops may be obtained from Laurie Kral, Air Programs Branch (Mail Stop 532) EPA, 1200 Sixth Avenue, Seattle 98101, or by calling her at (206) 442-1089.

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EPA - 305



News Release

83-54

Contact: Bob Jacobson

(206) 442-1203

August 3, 1983



FOR IMMEDIATE RELEASE

Three public workshops will be held this month by the U.S. Environmental Protection Agency to inform citizens and answer their questions about the proposed Federal standards to reduce emissions of inorganic arsenic from the ASARCO copper smelter in Ruston, Washington.

The workshop schedule:

| | | |
|---|---|---|
| Wednesday August 10 | Tuesday August 16 | Thursday August 18 |
| Time: 7 - 10 p.m. | 7 - 10 p.m. | 7 - 10 p.m. |
| Place: McMurray Interm. School S.W. 196th Street Vashon | Wilson High School 1202 N. Orchard Tacoma | Wilson High School 1202 N. Orchard Tacoma |

(more)

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These public workshops are designed to provide information on the impacts of the proposal on the community and to provide a forum for concerned citizens to discuss issues related to the proposal.

Ernesta B. Barnes, EPA's Northwest Regional Administrator, will moderate each of the workshops.

"The workshops are designed to describe the proposal of the arsenic standards and the information upon which it was based." Barnes said. "We also hope to get the views of an informed public and use this information when the Agency makes a final decision on the proposed standard.

"The workshops will be structured to allow plenty of time for questions. We'll be answering all those questions and will be forthright in giving all available information to people who want to make a contribution to the Administrator's final decision by giving their comments in writing or orally."

The opportunity for the public to give EPA oral testimony is scheduled from noon to 10 pm, Tuesday, August 30, in the Rotunda Room of the Tacoma Bicentennial Pavilion at 1313 Market Street. A second day of hearings will be held if necessary, at the same location on the next day.

A principal issue Barnes expects to be raised at the public workshops and public hearing is whether the arsenic controls proposed by EPA will provide the legally required "ample margin of safety" to protect public health. EPA has acknowledged that its proposed controls will substantially reduce the risks to public health but will not eliminate them.

"It is assumed by EPA that any exposure to inorganic arsenic by inhalation--regardless of the amount of the exposure--would result in a risk of lung cancer." Barnes said. "Even with the controls EPA has proposed, it is estimated that ASARCO will continue to release 189 tons of arsenic emissions to the atmosphere per year, with the result that there would still be some risk of lung cancer, although a lower risk than without controls."

People who want to familiarize themselves with the EPA proposal and EPA's estimates of health risks associated with ASARCO's arsenic emissions may obtain summaries prepared by EPA at these locations after August 10:

- Swasey, Mottet, Fern Hill, South Tacoma, Moore, McCormick, Kobetich, Municipal Reference and Main Branches of Tacoma Public Library
- Library, University of Puget Sound
- Lakewood and Peninsula Branches of the Pierce County Library
- Vashon Island Branch, King County Library
- Washington State Library, Olympia
- EPA Office of Public Affairs, 12th Floor, 1200 Sixth Avenue, Seattle.

Copies of the summaries will also be available at the three workshops. For additional copies of the fact sheets, or to make arrangements to see documents from which they are derived, please write Dee Ann Kirkpatrick at EPA (Mail Stop 541), 1200 Sixth Avenue, Seattle, Washington, 98101, or call her at 442-1200.

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U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101



REPLY TO M/S 601
ATTN OF:

August 8, 1983

As you know, the U. S. Environmental Protection Agency is charged under the Clean Air Act to set national emission standards for hazardous air pollutants which will provide "an ample margin of safety to protect the public health." This mandate includes setting standards for the control of arsenic, a substance known to cause cancer in people. The Clean Air Act does not define what the margin of safety should be but entrusts this decision to the Administrator of EPA, William D. Ruckelshaus, who will publish a final standard for arsenic next year.

The attached fact sheet, "The Risk to Public Health," will help to acquaint people with the health risks associated with arsenic emissions, particularly from ASARCO and will help them to recognize that the health risks have not been (and may never be) precisely quantified. Two other fact sheets "Arsenic Controls" and "Superfund and ASARCO" are also enclosed. They explain what the controls proposed by EPA are intended to achieve, what the actual costs to ASARCO will be, and how the proposed controls relate to EPA's concern about long-term arsenic deposits in the soil.

Public workshops are being held August 10, 16, and 18 to provide a forum for answering questions about the proposed standards. A public hearing will be held in Tacoma on August 30 for those individuals who wish to make an oral statement on the arsenic proposal.

The enclosed fact sheets are available to all citizens interested in this standard-setting process. For additional copies of the fact sheets, or to make arrangements to see documents from which they are derived, please write Dee Ann Kirkpatrick at EPA (Mail Stop 541), 1200 Sixth Avenue, Seattle, Washington, 98101, or call her at 442-1200.

Sincerely,

Anita Frankel, Director
Office of Public Affairs

Enclosures

A FACT SHEET ARSENIC CONTROLS

WHY THE SPECIAL ATTENTION FOR ASARCO'S TACOMA SMELTER?

The ASARCO smelter in Tacoma uses copper ore concentrate with a much higher arsenic content than any other U.S. copper smelter. Arsenic makes up about four percent of the ore at Tacoma; no other copper smelter uses ore concentrate with more than 0.6 percent.

Arsenic is a commercially valuable by-product of the Tacoma operation. The smelter is the only U.S. manufacturer of arsenic and arsenic trioxide; it produces one-third of all arsenic used in the country.

WHAT IS EPA PROPOSING FOR THE TACOMA SMELTER?

There are three principal phases in the smelting process that transforms raw ore into blister copper. (1) The ore is first run through a roaster as an initial step in gradually removing impurities. (2) What emerges from the roaster is run through a reverberatory furnace. (3) The molten mixture from the furnace is then sent to converters. EPA seeks to reduce the emissions of arsenic that escape capture in the third step, e.g., the converting process.

EPA is proposing that additional hoods be placed on the converters so that ASARCO would capture and collect "fugitive" arsenic given off during this third stage in removing impurities from the copper.

The EPA proposal would include a standard expressed in terms of equipment specifications for the collection device. The criterion used by EPA in designing this standard is what is called the "Best Available Technology", or BAT. BAT means the best controls available considering economic, energy, and environmental impacts. BAT is the minimum level of control which EPA would require for hazardous air pollutants such as arsenic.

IS THE PROPOSED "BEST AVAILABLE TECHNOLOGY" INDEED THE BEST ASARCO CAN DO?

One of the chief issues during the public hearing/public comment process is whether EPA's proposed standard does, in fact, represent the very best control technology available to ASARCO. Are there other operations or practices at the smelter where additional control can be employed to reduce emissions of arsenic?

There have been discussions among air pollution control engineers involved in the ASARCO-arsenic issue that other measures may exist which can be applied to produce even greater reductions in ASARCO's arsenic emissions. One example which has been suggested has been baghouse controls on the reverberatory furnaces which may play a major role in reducing the amount of arsenic which now escapes.

Other suggestions have been made that ASARCO may be able to reduce fugitive emissions throughout the smelter and that consideration be given to require ASARCO to use ore concentrate with a lower arsenic content. The feasibility of such requirements and the quantification of emission reduction and cost is the subject of an ongoing EPA task force effort. Comments from the public are encouraged and welcomed.

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WHAT WOULD EPA'S PROPOSED CONTROLS COST ASARCO?

EPA has estimated that it would cost ASARCO \$3.5 million to install the hooding equipment required by the proposed controls, and that the annual cost to operate the equipment would be \$1.5 million. Operation of the equipment is expected to increase the smelter's annual energy consumption by one-half of one percent over the 2.9 billion kilowatt hours of electricity the smelter now uses each year. EPA has estimated that its proposed controls could result in an increase in the price of copper by approximately 0.8 percent if the company chose to maintain its normal profit margin. The cost may be higher if additional or alternative controls are found to be necessary.

IS SHUTDOWN OF THE SMELTER A POSSIBILITY?

Yes, it is a possibility.

Regulation of hazardous air pollutants such as arsenic is required by Section 112 of the Clean Air Act. The only absolutely safe approach to setting standards for substances which cause cancer would be to set a standard that would reduce the emissions to zero. In setting standards previously for two other cancer-causing air pollutants, asbestos and vinyl chlorides, EPA promulgated standards that did not require shutdown of facilities that released those pollutants to the ambient air.

EPA can impose standards that go beyond Best Available Technology if, in the language of the statute, it is necessary "to protect the public health....with an ample margin of safety."

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A FACT SHEET

SUPERFUND AND ASARCO

WHAT IS SUPERFUND?

Superfund is the Federal program that allows EPA -- with the participation of State governments -- to respond directly to releases (or threatened releases) of hazardous substances and pollutants or contaminants that may endanger public health or welfare. The program was set up by the Comprehensive Environmental Response, Compensation and Liability Act of 1980. The law is referred to as "CERCLA", or, more popularly, as the Superfund law because it created a \$1.6 billion fund to deal with problems resulting from hazardous materials in the environment.

HOW DOES SUPERFUND COME INTO PLAY?

In April 1983, the Washington Department of Ecology (DOE) signed an agreement with EPA that called for DOE to lead a \$1.4 million EPA-funded investigation of contamination by hazardous chemicals in an area described as the Commencement Bay Nearshore/Tideflats area. The area includes Ruston, site of the ASARCO smelter. A sum of \$100,000 will be devoted to investigate contamination in Ruston, Maury Island and Vashon Island. Soils in those vicinities are known to contain arsenic and cadmium in amounts that have prompted the Tacoma-Pierce County Health Department and the Seattle-King County Health Department to issue warnings about the consumption of garden vegetables grown in contaminated soils.

WHAT IS THE OBJECT OF THE SUPERFUND INVESTIGATION?

The investigation, to be managed by DOE and the Tacoma-Pierce County Health Department, will attempt to establish the pathways by which arsenic finds its way into the urine of school children. There are a number of suspected pathways: household dust, windblown dust from unpaved lots and roads, vegetable intake, playground soil and smelter emissions. DOE and the health department will attempt to determine the most significant pathways. According to the current schedule, the investigation should be completed by November 1984. Once the pathways are established, EPA has the authority to order the source of the contamination, if known, to take corrective action that will eliminate the risk to health. If a source of the contamination refused to undertake the clean-up, EPA has the legal authority to do the job itself with the understanding that all costs incurred must be repaid to EPA by the source.

WHAT IS SUPERFUND'S RELATIONSHIP TO THE PENDING EPA PROPOSAL?

The pending EPA proposal to place new restrictions on arsenic emissions from ASARCO is separate from the Superfund program, although the two have similar goals. The proposal has as its objective the reduction of arsenic from current and future smelter emissions. The Superfund program is directed toward reducing the health and environmental risks posed by the historic build-up of arsenic in the soil.

Until the joint DOE-health department Superfund investigations are completed, what should or can be done to remedy the historic deposit of arsenic in the soils will not be known. Any cleanup action, however, will be planned with the help of the public. An advisory group is being formed, and will begin meeting soon. For more information about the public's involvement with Superfund activities, contact Derek Sandison of the Tacoma-Pierce County Health Department at (206) 593-4750.

A FACT SHEET

THE RISK TO PUBLIC HEALTH

Arsenic, in its inorganic form, has long been known as an acute poison to humans when ingested in relatively large amounts. However, more recent data have shown that exposure to lower levels of arsenic results in skin and lung cancer in humans. For cancer-causing substances, such as inorganic arsenic, scientists are unable to identify a safe level of exposure. Therefore, EPA and other federal agencies have taken the position that cancer may occur at any level of exposure to arsenic no matter how low, with the risk of cancer increasing as exposure increases.

For the purpose of developing its arsenic regulation, EPA has determined that the ASARCO smelter should be controlled at a minimum to the level that reflects best available technology (BAT) and to a more stringent level if necessary to prevent health risks that are unreasonable. This approach requires that EPA estimate the cancer risk remaining for the population after these controls are in place and then determine if the remaining cancer risk is acceptable, taking into account the costs and technical feasibility of reducing the risk further.

To calculate this remaining risk, EPA combined data from two different types of analyses. The first analysis provides what is known as the unit risk number. This number is defined as the lifetime lung cancer risk that would occur in a population which is exposed throughout their lifetime to one microgram per cubic meter of arsenic in the air they breathe. (A microgram is equal to about 1/28 millionth of an ounce and a cubic meter is about the same as a cubic yard. Therefore, one microgram per cubic meter is about 1/28 millionth of an ounce of arsenic in a cubic yard of air.) This unit risk number is calculated by using data from studies of workers who were exposed to arsenic in smelters and at a pesticide manufacturing plant.

The second analysis estimates the exposure for residents living near the smelter. This is done with mathematical models. Utilizing data on emissions of arsenic from the ASARCO smelter as well as information on weather and geographic conditions, a dispersion model is used to calculate the concentration of arsenic expected at over one hundred locations within approximately 12 miles of the smelter. Combining these exposure estimates with population data from the Bureau of Census gives an estimate of the number of people exposed to various concentrations of arsenic within about 12 miles of the smelter. This 12 mile distance was chosen because the mathematical models used tend not to be as accurate at a greater distance. (While our analysis stops at about 12 miles, it must be realized that risk from exposure to arsenic emissions extends beyond this distance, though at a reduced level.)

By multiplying the unit risk number and the estimated exposure for people living around the smelter, it is possible to make an estimate of the cancer risks expected in the ASARCO community as a result of arsenic exposure. For those people living within one mile of the smelter, the lifetime cancer risk remaining after controls have been installed would be about 0.2%. This is in addition to the normal lifetime cancer risk of about 20% that would be expected without arsenic exposure. Within the 12 mile area this excess life-time cancer risk, after controls are installed, would be 0.004%. Another way of expressing this risk is by using lung cancer incidence numbers. Lung cancer incidence is the expected number of lung cancer cases that would result each year from arsenic exposure within 12 miles of the smelter. Without additional controls, the estimated lung cancer cases are approximately 4 per year. After the proposed controls were installed, the estimated number would drop to approximately one per year. To keep this in perspective, these numbers should be compared to the several hundred lung cancer deaths that are normally expected each year in a population the size of that found within this 12 mile radius.

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UNCERTAINTIES IN RISK CALCULATIONS

The process of calculating these risks for the population around the smelter involves many assumptions and uncertainties. So while these estimates of risk are a useful tool in the decision-making process, MUCH CAUTION SHOULD BE EXERCISED TO AVOID RELYING TOO HEAVILY ON THE NUMBERS PRESENTED ABOVE. These numbers have considerable uncertainty for the following reasons:

1) MODELING ASSUMPTIONS - Measurement of air concentration of arsenic around the ASARCO plant have not been done thoroughly; however, the measurements that have been obtained indicate lower concentrations than those predicted by the dispersion model. Arsenic emissions data from the smelter used in the dispersion model are not precise. In many cases these emission rates were based on assumptions rather than actual emission tests. This is especially true for fugitive emissions which are very important in calculating concentration yet are very difficult to measure. Also, estimates of how these arsenic emissions mix with the ambient air are hard to determine because of the complex geography and lack of specific weather data for the area around the smelter. These problems may explain why the ambient monitoring around the smelter shows lower concentrations of arsenic than EPA's dispersion model predicts.

2) EXPOSURE ASSUMPTIONS - A principal assumption is that all persons living within the 12 mile radius of the smelter will remain in the same location for a 70 year lifetime and are exposed to a constant, average concentration of airborne arsenic. This assumption could result in large overestimates of arsenic exposure for those who spend a lot of time away from their residences and in underestimates for workers employed at the smelter. Additionally, exposure to arsenic from resuspension of arsenic bearing dusts from city streets, empty lots, and playgrounds has not been taken into consideration.

3) UNIT RISK NUMBER - Because arsenic is a carcinogen, it was assumed that a linear relationship exists between exposure and risk. Simply stated, this means that a person who inhales one microgram of arsenic per cubic meter of air is one-tenth as likely to get cancer as a person who inhales ten micrograms per cubic meter. If the relationship between exposure and risk is not linear, a different unit risk number could result which would in turn change the lung cancer risk estimates made for the population around the smelter. It is unlikely that the actual cancer risks would be higher than those predicted by EPA, but they could be substantially lower.

EPA is now in the process of reviewing the data used in calculating risk estimates, especially those data which relate to arsenic emissions and dispersion modeling. If necessary, new data will be developed in these areas to permit EPA to better estimate risks to the smelter community.

U.S. Environmental Protection Agency
Public Comment Form

IV-F-9a

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

Effect of Arsenic in soil?
" " " on plants
" " " in Animals
" " " in Shellfish
" " " in Gardens
" " " in Animal Products

2. How can we improve the workshop agenda, speeches, discussion, etc.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

Arsenic Emission standards must
encompass more than just Arsenic in air

All signed comment sheets will be entered into the public record. Please hand in this form before you leave this evening, or fold, staple, and mail.

Name: (b) (6)
Address: Burton
Date: 8-9-83

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U.S. Environmental Protection Agency
Public Comment Form

14-F-96

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

2. How can we improve the workshop agenda, speeches, discussion, etc.

no speaker should
talk more than
10 minutes; audience
shifts.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

Don't use blue lines in
slides; make all elements
in slides at least 3 inches
high

All signed comment sheets will be entered into the public record. Please hand in this form before you leave this evening, or fold, staple, and mail.

Name:

Address:

Date:

(b) (6)

(b) (6)

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U.S. Environmental Protection Agency, Region 10
Laurie Kral, Docket Clerk, M/S 532
1200 Sixth Avenue
Seattle, Washington 98101

U.S. Environmental Protection Agency
Public Comment Form

1V-F-9c

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

1. I'd like to see samples (hair, nail, blood) taken of dead people + animals to determine if arsenic or cadmium influenced their death.
2. Also, the general public should be offered these tests free of charge.
3. Please test water + soil.

2. How can we improve the workshop agenda, speeches, discussion, etc.

Next time I would like you to be a little bit more informed about the present situation. (review tests on school children 10 years ago.)

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

If there isn't a significant difference in the amount of arsenic blowing this way, please close the plant down!

All signed comment sheets will be entered into the public record. Please hand in this form before you leave this evening, or fold, staple, and mail.

Name:

(b) (6)

Address:

Date:

3/12/83

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9861-9061
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



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1V-F-9d

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AIR PROGRAMS DIVISION

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

We need soil tests in various parts of Vashon to know if we should continue to garden. We need to know the risk level.

2. How can we improve the workshop agenda, speeches, discussion, etc.

A full report of the meetings should be in the local papers.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

It is strange that the Ruston Smelter can continue pouring out tons of waste on our homes and land without some real action to force the company to clean up their act.

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(b) (6)

Name

Address

Date

Vashon, Wa. 98070
8/82

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1V-F-9e

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public? SINCE YOU APPEAR TO BE BASING YOUR STANDARDS UPON ^{FACTORS} OTHER THAN HEALTH EFFECTS IT WOULD HAVE BEEN HELPFUL TO HAVE A BETTER ANALYSIS OF THE ECONOMIC SITUATION. THESE QUESTIONS COME TO MIND. HOW MUCH PROFIT DOES THE TACOMA PLANT MAKE? WHAT PORTION OF THIS PROFIT COMES FROM THE ARSENIC OPERATION? THE STATEMENT WAS MADE THAT WITHOUT THE ARSENIC OPERATION THE PLANT WOULD NOT BE PROFITABLE YET OTHER SMELTERS EXIST AND CONTINUE TO BE PROFITABLE WITHOUT ARSENIC OPERATIONS. NO MENTION WAS MADE OF JOBS CREATED BY MANUFACTURE, INSTALLATION, AND MAINTENANCE OF POLLUTION CONTROL DEVICES.

2. How can we improve the workshop agenda, speeches, discussion, etc.

THE FACILITORS NEED TO SEE THAT THE QUESTIONS ARE ANSWERED DIRECTLY. THE ISSUES RAISED BY SOME OF THE QUESTIONS WERE OFTEN SKIRTED OR IGNORED ENTIRELY. I THINK IT WOULD HAVE BEEN A GOOD IDEA TO INCLUDE SOME HEALTH DEPT. OFFICIALS IN YOUR PRESENTATION. THESE ARE THE PEOPLE WHO HAVE WARNED US AGAINST EATING OUR FRUIT & PRODUCE. SOME EPA STAFF DISPLAYED THEIR IGNORANCE ABOUT THESE WARNINGS.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards? EPA AND ITS STAFF SEEM INCAPABLE OF LOOKING AT THE MODEL OF PROTECTED HEALTH RISKS OBJECTIVELY. THE MODEL WAS DEFENDED AGAINST SOME VERY VALID CRITICISMS SUCH AS THE FACT THAT THE MODEL IGNORES HISTORIC DEPOSITS OF ARSENIC BY YOUR OWN FIGURES FOR 60 YRS. THE PLANT HAS INTRODUCED TO OUR ENVIRONMENT OVER 700,000 TONS OF ARSENIC YET YOUR MODEL PROJECTS HEALTH EFFECTS BASED ON A MERE 190 TONS PER YEAR. THIS COMPLETELY IGNORES PAST DEPOSITS AND THE EFFECTS FROM EVER ACCUMULATING ARSENIC DEPOSITS. MY INTERPRETATION OF YOUR MODEL IS THAT IF 190 TONS A YEAR IS DISPERSED IN A 12 MILE RADIUS AREA AND THEN ^{SOMEHOW} REMOVE FROM THE SITE THUS RESULTING IN A CONSTANT EXPOSURE OF SO MANY PARTS PER CU. METER THEN SO MANY DEATHS SHOULD BE EXPECTED. THIS YOU CALL SOUND SCIENCE? AND THEN YOU ADD INSULT TO INJURY BY SUGGESTING THAT YOUR ESTIMATES FOR HEALTH EFFECTS MA BE TOO HIGH.

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(b) (6)

Name

Address

Date

VASHON, WA 98070

8/11/00

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1V-F-9F

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

- ⑥ People need to know the health effects of the accumulation of As in addition to current or proposed emissions.
- ⑥ We need a detailed account of the economic equation used to determine what level of control would cause the smelter to close.
- ⑥ Can the emissions from the main stack be controlled and at what cost or benefit?
- ⑥ What is As used for as a product from the Tacoma smelter. Are these products safe, where does the As end up in the environment.
- ⑥ An accounting of the long term cost-benefit of the smelter's operation. Should include: health costs, time loss cost, value of suffering for the ill and those that fear illness, reduced productivity of farms & gardens, etc.

2. How can we improve the workshop agenda, speeches, discussion, etc.

Include local smelter experts, they seem to know more than the EPA personnel. These could include Health dept and PSE&C people.

- stop trying to sell the proposed standard. Focus of educating us to allow us to decide an acceptable risk so we can properly testify in Vol 2

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

The proposed standards do not provide an ample margin of safety for the public. The health hazard is compounded many times over by how much As has accumulated in the soil. Unless this ~~severe~~ accumulation is taken into account the standards provide no relief.

The BAT approach stifles the development of pollution control technology. It is in the smelters interest to have a very low level of BAT. Since ASARCO controls such a large part of the smelting industry it sets its own BAT.

The standard should be set at a life level (in this case probably close to zero). Industry would then develop much safer processes to manufacture these products.

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Name:

Address:

Date:

WASHINGTON, WA 98070

August 12, 1983

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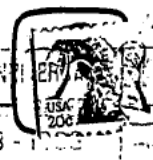
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IV-F-9 g

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

What kind of air level accounts for what kind of soil level.

2. How can we improve the workshop agenda, speeches, discussion, etc.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

Can you really separate the air levels from the soil levels? Might an amount in the air insignificant as regards lung cancer cause an unacceptable build up in the soil? The amount of arsenic and heavy metals settling on the land from the air need to be less than the soils capability of processing the metals in order bring down the present accumulation. The soil level is directly relevant to lungs when you consider children's exposure on dusty playgrounds or people clearing land or gardening.

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(b) (6)

Name: _____

Address: _____

Vashon

Date: _____

August 12, 1983

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IV-F-9h

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

All areas of health issues, that's what people are going to be concerned about, not a graph on equal risks such as drinking & diet pop. contaminants, etc., that has led to more, but actual facts. You should have gone into a session with all the facts, or plans to do more health studies. It was very discouraging.

2. How can we improve the workshop agenda, speeches, discussion, etc.

Be more prepared as far as looking into the background of previous work i.e. Bapfen, union tests on Bapfen schoolchildren

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

I honestly felt it was a bit of a "sell" for the EPA, and I feel that they get a lot of education from the people of Vashon, so maybe that was my feel. If the EPA does not get with the program & do some real hard-core studies on all the effects of Asa on environment some private studies will come in & when it comes going on, the EPA may be a bit red-faced.

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Address: _____

Date: *Dec 10, 1977*

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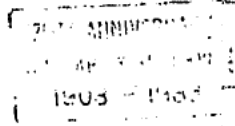
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1V-F-91

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

- What are the symptoms of chronic low dose arsenic poisoning? What health problems does it cause in small doses?
- Is breathing small arsenic doses stressful to automation?
- Air monitors positioned around Washon's Millery giving daily arsenic readouts would help us know our exposure levels daily.
- How much is in the soil, the water, fish & shellfish locally from arsenic precipitated out of the air?
- What are the economic disadvantages to living next to ASARCO: a clear assessment of reduced property values, hazards in gardening, curtailment of ventures such as bee keeping, horticulture, goat milk & cow milk business?

2. How can we improve the workshop agenda, speeches, discussion, etc.

- Include the data on levels of ASARCO emissions before & after BAT & compared to other arsenic-producing plants in U.S. in handout info.
- Be more comprehensive in the health section - what are the health problems existing short of death? - And how does the problem multiply when ingestion from air, water, dirt, & food are merged - particularly for small children.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

How would you like tons of arsenic precipitating out over your neighborhood over the course of a year? BAT is a poor substitute for clean air

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(b) (6)

Name:

Address:

Date:

Aug. 11, 1983

Washon 7802

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IV-F-9j
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Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

2. How can we improve the workshop agenda, speeches, discussion, etc.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

- a. Arsenic is a poison.
- b. Arsenic is vented from the Ruston Asarco plant and carried to my home.
- c. The hazard cut-off level has not been defined as lower than my exposure.
- d. The sole conclusion is that my (and my family's) health is in peril.
- e. Despite all the stochastic crap someone should shut down the source of poison.

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Address: (b) (6) _____
Vashon, Wn. 98070
Date: Aug. 28, 1983

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AIR PROGRAMS BRANCH

1V-F-9K.

U.S. Environmental Protection Agency
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Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

Aren't there other than deaths caused by arsenic, i.e. allergies of skins lungs?

It seems members of EPA are not aware of local health dept warnings on arsenic or Cadmium.

2. How can we improve the workshop agenda, speeches, discussion, etc.

Use fewer graphs and lists. Perhaps it's easier said than done. But they are very confusing and tend to lose attention of listeners.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

The invasion on the land and air space of the public causing concern for growing vegetables and fruits to enable subsistence farming is beyond the ethical rights of a company to exist. The general public's right to a garden without fear in an area so conducive to home gardening is appalling.

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(b) (6)

Name: (b) (6)

Address:

Date: Washon, Wn 98070

8-10-83

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AUG 15 1983

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public? A review of pertinent empirical Arsenic concentrations in the soil ~~and~~ humans (children's urine, etc.) and animals within a certain radius of the plant. Most of the "risk management process" as outlined by Bob Ajax and Dr. Betty Anderson of EPA appears to be based on models that are totally unacceptable from a statistical point of view. Why isn't there a system of arsenic monitors overseen by an uninterested party (not ASARCO) to lend some empirical data points to these models? Is all of the epidemiological/demographic modeling done in-house or could Center for Disease Control, Atlanta be called in to study the data that exist?

2. How can we improve the workshop agenda, speeches, discussion, etc.

Bring in experts from outside EPA who are objective & uninvolved in this particular political issue to lecture on airborne dispersion, medical effects of arsenic, measurements of arsenic in humans/animals (bees)/soil/plants.

It seemed to me that the EPA experts sent here at some expense from Research Triangle Park presented pitifully poor data and models - certainly nothing that competent scientists would want to base a far-reaching decision upon. Peer review of these data should be mandatory.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

(1) I would suggest that the Center for Disease Control, Atlanta be asked to prepare an opinion on the levels of arsenic found in bees and school children in the area of the smelter & regarding what an "ample margin of safety to protect the public health..." means to their agency.

(2) I would submit your airborne arsenic dispersion model to scrutiny by non-political ^{scientists} statisticians for their opinion as to its validity. Mr. Ajax claims that the one data point he tried to fit to his dispersion model was off by a "factor of fifteen". His conclusion (which he conveyed to the audience) was that this meant that ^{arsenic} levels further from the plant must be lower. What this type of error would mean to any statistician or person experienced in modeling of systems is that it is an unacceptable model!

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Name:

Address:

Date:

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Vashon, Wa
9807

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Public Programs
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IV-F-9m

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

Accurate charts —
don't use a healthy man in a
vacuum — be reasonable about
about kids — elderly — sick —
what about the arsenic already here.

2. How can we improve the workshop agenda, speeches, discussion, etc.

Keep all people together

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

If the air curtain stream is to be utilized
then strict control with high fines standards be
put in place — so that the smaller city
runs driving certain temperatures — air
currents — updrafts etc.

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Name: _____

(b) (6)

Address: _____

Date: _____

5-10-53

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1V-F-9n

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

2. How can we improve the workshop agenda, speeches, discussion, etc.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

It seems to me that dealing with the problem of the Toconota smelter on a piecemeal basis, ~~in~~ in this case, arsenic ^{emissions} alone, without considering the compounded effects of ambient arsenic or other toxic emissions such as cadmium, SO₂ etc. is bound to produce an inaccurate picture of the health hazards in our area. I would like to see more comprehensive research on the combined effects of all the pollutants we are being exposed to.

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In addition you seem to be ready to make a decision on this with no concrete data from Noshon Island where I live.

Name: (b) (6)

Address: (b) (6)

Date: 8/10/83

WASHINGTON, DC 20540

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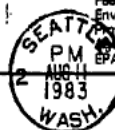
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AUG 12 1983

AIR PROGRAMS SECTION

U.S. Environmental Protection Agency, Region 10
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U.S. Environmental Protection Agency
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IV-F-90

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

- A bibliography of ^{relevant} studies on the health effects of arsenic & cadmium; and a list of existing and proposed studies conducted in this area. Also peer review of these studies.
- What studies does the EPA expect to complete prior to the arsenic standard decision in March '84?
- How much Superfund money will be devoted to this issue?
- How much has been secured?

2. How can we improve the workshop agenda, speeches, discussion, etc.

I think additional workshops are needed prior to hearing and that hearing should be scheduled after on going studies (dispersion etc.) are available or at least . . .

- When will terrain be incorporated into dispersion model & when will the results of this study be available?
- Are/were operational controls considered in developing proposed standard as well as technological controls such as the arsenic content of copper ore?

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

↓ summary
a list of credible scientific studies that will be used in the decision process, early enough for the public to have the opportunity to digest the merits of such data & studies. Consider

- Who is on the "economic task force" mentioned by Alex Smith. What information, issues, studies are being used to contribute to that aspect of the decision. i.e. what are the economic issues being considered in the decision

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- When will Final EIS on proposed standard be available?

(b) (6)
Name: (b) (6)
Address: Vashon, 98070
Date: Aug 10, 1983

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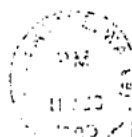
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AUG 12 1993

AIR PROGRAMS DIVISION

U.S. Environmental Protection Agency, Region 10
Laurie Kral, Docket Clerk, M/S 532
1200 Sixth Avenue
Seattle, Washington 98101

U.S. Environmental Protection Agency
Public Comment Form

1V-F-9p

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

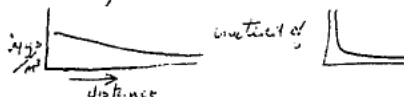
Information on quantities of As we are ingesting by eating our produce. (The local health dept. seems to feel that produce from our gardens provides a significant source of the stuff.) Perhaps you could start by sharing the Health Dept.'s information, as well as that of the bee studies done earlier this year.

2. How can we improve the workshop agenda, speeches, discussion, etc.

I was pleased with the meeting as it was.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

The graph used by one of the speakers to indicate expected concentrations of As as a function of distance from the plant was said by the speaker to be based incorrect by actual measurement of $\mu\text{g}/\text{m}^3$. In fact the actual emissions were lower than expected at the site by a factor of 15. Rather than indicating that the ^{positive} emission problem is less than the mathematical model supposes, isn't it more likely that the concentration is greater farther from the plant? As.



My sympathies are with strict limits of As & Cd emissions. (Apparently the SL limits aren't enforceable at present) if that means plant closure, so be it.

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(b) (6)

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Date:

Aug 16, 1973

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Public Comment Form

IV-F-92

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

Health impact of contaminated soil

2. How can we improve the workshop agenda, speeches, discussion, etc.

The national level reps didn't seem familiar with local-county health standard

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

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Name:

Address:

Date:

(b) (6)

Dockton Wa 98020

8-10-83

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1918

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Public Comment Form

TV-F-9r

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

Presentation by a physician to respond to the medical implications and physiological questions which the remainder of the EPA staff did not seem to be able to handle. Several questions regarding consequences of dietary intake and impact of arsenical pollution of soils were not answered. Considerable confusion was generated about arsenic vs. other pollutants, which EPA staff did not seem to want to discuss - and the public did. More facts and fewer (less) reliance on "models" when it is apparent that the models over-estimate. Information helpful would be why the taxpayer dollars are being spent on agitating a lay public which is only further confused by the lack of concrete information which EPA has to present. Bite the bullet and set the standards. Don't seek out "authority" from a constituency which cannot respond to vague information, lack of facts, and computer projection.

2. How can we improve the workshop agenda, speeches, discussion, etc.

Obvious that there was no individual trained in education to work with EPA staff. Responses of staff were not always mutually supportive; answers were vague; presentation techniques poor (especially some of the designated facilitators). Organization of material could be improved. The most lucid, rational and understandable presentation was that of Ms. Barnes. There was little "discussion" because there were few facts to discuss. Great need for medical perspective to respond (with creditability) to the many questions regarding physiology, health effect - modeling won't answer people's fears and concerns which result from misperception of fact or sociopolitical rantings. Trying to break large groups into small groups is unwieldy - why not take questions written out and respond?

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

It was never made clear what the 'proposed standard for emission' was - Confusion #1; the point of the 'educational forum' was also, in the end, not clear (e.g., how can you educate without facts). The frequent use of phrases like "maybe...perhaps...possibly...might...could" certainly doesn't instill confidence. If, under Section 112, it is EPA's responsibility to set a standard, then set one - recognizing that absolute standards are unrealistic (zero emissions). The incidence of lung cancer in Tacoma is already high - there is no direct linkage to arsenic, and many studies in the community have not been able to demonstrate a clear link between the plant's emissions and threat to the public health. Individual life behavior also is a factor (smoking, overexposure to sun, etc). Common sense would suggest application of the "best available technology", with current constraints (no smelting under a north wind, etc) - use of saccharin-flavored soft drinks was poor analogy for risk because the few studies conducted are very controversial. (Anderson, Vachon). The review process appears to be a futile activity which serves to confuse more than inform - and obviously expend scarce federal dollars in a media circus and environmentalists' self-serving platform.

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Name: _____

Address: _____

Federal Way, WA 98003

Date: 12 August 1983

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IV-F-9s

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Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

NO ADDITIONAL INFORMATION

2. How can we improve the workshop agenda, speeches, discussion, etc.

NO COMMENTS

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

i don't care what levels the experts agree on. i
only care about the fact that the government is
trying to force us to pay for something that
we don't need. i don't want to pay for
something that we don't need. i don't want
to pay for something that we don't need.
i don't want to pay for something that we
don't need. i don't want to pay for
something that we don't need.

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Address:

Date:

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Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

estimate of ^{estimated} degree of uncertainty - eg
confidence limits - of est. risks or other
models

2. How can we improve the workshop agenda, speeches, discussion, etc.

it was excellent.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

seemed painfully obvious that EPA's tone in presentation favored ASARCO; and of course there is strong political pressure in that direction. It appeared that decision had already been made preliminarily, putting contra-emission perspective on defensive and less actively seeking out info. unfavorable to continued Arsenic emission - therefore, only a powerful input of information or public opinion could sway EPA in the anti-ASARCO direction.

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Name: (b) (6) (b) (6)
Address: Vashon
Date: 9/20/83

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IV-F-94

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

*It seems the EPA-reps. respond with as many,
"we don't know" as definitive answers.*

2. How can we improve the workshop agenda, speeches, discussion, etc.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

*I don't think the standards will ever be good enough
when we are talking in terms of "tons" of emissions.*

*Why isn't cleaning up quarter master harbor under
study? Of re-opening the natural drainage through the
land fill at Portage.*

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Name: (b) (6) (b) (6) (b) (6)
Address: (b) (6) - Vashon, Wa
Date: 8-10-83 9:20

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TV-F-9v

Thank you for attending the workshop this evening. To help us evaluate our workshop and prepare for the next steps in our public review process, please tell us:

1. What additional information would be helpful to the public?

The type of cancer that is caused by the arsenic emissions was not brought out. Such information would help, I believe.

2. How can we improve the workshop agenda, speeches, discussion, etc.

3. Are there any other comments you would like to make about the review process or about the proposed arsenic emission standards?

I Think that many people are running scared!

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(b) (6)

(b) (6)

Name (b) (6)

Address:

Date:

Aug 9, '83

Varkon

98070

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Q&A From Vashon Workshop #1
August 10, 1983

- Role of environmental hazards in causing cancer, sum of "small" risks.
- What are other factors/risks to human health from ASARCO?
- What will EPA do to protect honey bees?
- Is risk due to stack emissions?
- Will controls increase arsenic?
- What will EPA do about arsenic in soil and water?
- Is EPA only concerned about arsenic and cancer? What about other pollutants?
- What about symptoms of SO₂, cadmium, etc., from ASARCO?
- Can ASARCO (80 years old) set BAT?
- Why hasn't EPA shut the plant down? (Arsenic is poison).
- Is it safe to eat produce from Vashon gardens?
- Where can citizens take produce to be tested for contamination?
- Who are "sensitive" populations? Children?
- Is the stack monitored 24 hours per day?
- Will EPA Superfund test fish and vegies?
- Why doesn't EPA ban high-arsenic ore?
- Does EPA consider economics in setting standards?
- Should EPA consider the commercial product (arsenic) as well as pollutants?
- Is EPA working on a "cost-benefit" formula of \$\$ vs. health?
- Can costs of additional arsenic controls be passed on with cost of commercial arsenic produce at ASARCO?
- What is Superfund doing to measure health effects in Commencement Bay?
- To what extent will EPA ask community to protect themselves -- move, not eat produce, etc.?
- Why isn't arsenic in soil included in risk assessment?

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- 2 -

- Why doesn't EPA set its standards based on total pollutant load? Include historical accumulations.
- Do prevailing winds increase exposure to Vashon/Maury residents?
- Does it take a foot of dirt to make garden safe? Who pays?
- Is EPA prediction model available? Is it a computer model?
- Any data on deaths on Vashon compared to other areas?
- What can individuals/community do to untie EPA's hands? Will public outcry help?
- Does EPA consider arsenic emissions insignificant? Is EPA overly concerned about smelter?
- Does restarting plant after shutdowns for SO₂ increase arsenic emissions?
- Are some people more susceptible to industrial pollutants?
- Can Quartermaster harbor be flushed to reduce pollutants in harbor?
- Is ASARCO operating with an ample margin of safety?

ASARCO ARSENIC WORKSHOP

August 10, 1983
Tom Hall
Laurie Kral
Room 2

No one has addressed what happens to the soil

- 90 years of dispersion has resulted in higher than normal but not enough to cause illness.

- Studies done by King County & others said levels were "much higher"

- We have two aquifers on Vashon. I have seen no information on levels of arsenic in Water. Superfund looking at this. Are we addressing only arsenic or cadmium too? Cadmium came from smelter years ago.

- Concern is-how dangerous is it to eat vegetables in your garden?

Superfund intends to do garden studies. King County and Pierce County Health Departments have some information.

- Recent study - no evidence of high arsenic in Vashon wells...

- What is the capture ratio of a.p. control devices on the stack?

Is there a single point where captured emissions are handled?

Why is there no treatment on final emission up stack?

- BAT helps people in the plant. What is BAT for stack emissions?

Replace ESP with baghouses.

- After sec. hoods are installed, what would be the next step?

For remaining 1/2% at ground level, O & M requirements.

- If experts decide the arsenic level of arsenic is safe for us, what voice do we as a body have in all this?

- Testify at hearing, *bring suits*

- What happens to the stuff in the plume?

- Was Seattle area higher in Arsenic?

- Is there a limit on Arsenic Ore?

-2-

- Arsenic levels or Environmental issues included too?
- Are you measuring the arsenic in the shellfish in this area?
- Lab results on children's urine/blood test: Where do they go?
(Burton Elementary)
- Any studies on arsenic birth defects or miscarriages done in the smelter area.
- Health effects of arsenic; cadmium, sulfur oxides *acting together*
- What do you classify as a "sensitive person" Are you going to screen?
Range of physical effects?
- No chance in what air we breath? *?*
- What are we doing with Phillipine Ore?
- *What was this student in Burton Elementary could have such a high*
arsenic reading in the urine test?
- Effects on animals?
- # of Studies need to be done? Eggs, beef, shellfish
- What are the symptoms of arsenic poisoning? Progressive?
- Arsenic in soils/air/water?
- Are the decisions going to be made before Superfund data is issued?
- Quality of life - What are the chronic effects (all sources)
- Charts do not coincide with what the people feel? What specific tests are being done in Vashon before Nov? Air, soil, etc.
- Who is ASARCO's principle buyer of copper?
- Are any other tests going to be done? Specific to Vashon. *?*
- Why is EPA proposing two different standards. One for Region 10 and the rest of the nation?
- What info is available on the economic situation?
- Scope of info. is limited.

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-3-

- Given the information presented - What is EPA's stand?
- Is the Court sensitive to the problem?
- Need for baseline studies.
- Content of ores - regulate it
- Why aren't we looking at lead in soil?

VASHON ISLAND -PUBLIC MEETING, August 10, 1983
Questions Raised by Group 3
Recorder: Lori Cohen

1. How is the arsenic from the smelter used?
Will reducing arsenic product affect the electronics industry?
2. Collecting the arsenic and reusing it in other polluting products (e.g. pesticides) is not an adequate control--the arsenic will eventually contaminate the environment. How is this considered in the rulemaking?
3. How many people does EPA have here tonight?
4. Why does EPA conduct air pollution tests at the newer El Paso plant?
5. Why not process Phillipine ore in a less populated area?
6. DOE has tested urine and hair samples in children over a seven year period. Why doesn't the data show that since levels have dropped over the last seven years? What is the latent period for arsenic? What do monitored levels mean? Why are the levels as high (10 ug/cu3) as for workers in the plant?
7. Disagreement with EPA's interpretation of Section 112--particularly the economic considerations.
8. Only risks discussed tonight are lung cancer, which is a long-term risk. What about effects on our health right now? How does arsenic affect common ailments such as asthma?
9. Past controls (baghouses and other particulate controls) have not shown reduced amounts of arsenic in urine. How does EPA know that additional controls will show improvements?
10. Why not substitute other smelting processes (e.g., electric smelting or flash smelting) for existing processes?
11. Does EPA have data from 1973 and 1976 King County tests on children's exposure to arsenic? How about retesting the children? The data could be very revealing, particularly for those children that have moved to an area that is considerably more or less affected by the smelter emissions.
12. Is EPA studying fugitives, dust, soil, etc. around the smelter?
13. What about routes of exposure other than inhalation?
14. Why has ASARCO continued to obtain variances from complying with the law? Isn't it time to enforce the law? What authority does EPA have to do this?
15. What is Ernesta's background? What expertise does she have to advise Bill Ruckelshaus in making the arsenic decision?
16. Seems like EPA is leaving the interpretation of the law up to the public. "The law is the law--isn't it?"

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17. What was the "exception" given to ASARCO in the July proposal? Why did EPA single out ASARCO and apply less stringent regulations to ASARCO than to similiar plants?

18. Wall Street Journal article said arsenic proposal is less stringent than unidentified EPA staff said it should be. This suggests EPA's pre-disposition to keeping the plant open. Would you comment on this?

19. What about cadmium found around the smelter?

20. "Ample margin of safety" seems like balance between health and loss of jobs. Safety and health is far more important [to me] than jobs. How can I relate this for formal public testimony?

21. Are public funds available as a subsidy to the plant?

22. EPA's assessment charts do not accurately portray populations exposed to arsenic (e.g., data does not differentiate between older populations, populations exposed to many pollutants, or children).

23. Some of the studies cited by EPA are based on data from hospital registryrs. These are inadequate for assessing health affects, particularly on Vashon where there is no hospital.

24. Are there different forms of arsenic? How do these breakdown? What health effects do these various compounds cause?

25. Do the health studies conducted take into account the lifestyle of many Vashon residents--that is, those who raise their own food?

26. Emission ratios from stack seem inaccurate.

27. Charts are "whitewashed". Why aren't other pollutants considered in the risk analysis?

28. The "1 in 1000" health risk seems higher than other risks accepted by EPA. Other risks are often "1 in 100,000". Why is this decision different?

29. EPA should more fully consider electric smelting. [County air pollution control official agreed].

30. Dispersion model is inaccurate; there are too many uncertainties for use in this type of decision. Why not test actual sites and use that data? Where has data been collected? How many actual measurements have been taken? Have winds and other weather conditions been taken into account?

31. Does ARSARCO emit arsenic in all weather conditions (even when SW prevailing winds blow)?

32. Is this meeting only covering air emissions? Have many concerns about arsenic bioaccumulation and water pollution.

33. Does ARSARCO control stack emissions and low level emissions?

34. What are the longest averaging times used in estimating emissions and setting standards.

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35. Models are used rather than actual data--why?
36. Seems like EPA is, once again, apologizing for lack of data. Is EPA making any changes in its air monitoring strategy in order to get data for making such decisions?
37. Can EPA provide a synopsis of data sources to public and subject them to peer review?
38. How will on-going studies (particularly Superfund studies) be taken into account in the March decision?
39. How much money is available for Vashon under Superfund? What is included in this amount (seems awfully low)?
40. Why doesn't EPA establish an ambient standard for arsenic as with other pollutants, particularly since there is an established ambient air monitoring network.
41. We've been suffering from a lack of data for at least 10 years when the smelter was first required to put on controls. Why not require the smelter to provide better data?
42. Why doesn't EPA conduct additional monitoring on Vashon?
43. Why wasn't Vashon included in original Superfund allocation? [Vashon apparently not included until citizen input.]
44. This decision requires technical, political and economic concerns be taken into account. Is there a formal process by which this will happen? Real estate values, for instance, will be affected by this decision but it doesn't seem like this will be taken into account.
45. Why does EPA think there is a linear relationship between arsenic and health effects? If so, this would be a "medical phenomenon."
46. Why is EPA only focusing on cancer? Arsenic and ^{carbon monoxide} ~~cobalt~~ have been shown to cause respiratory stress as well. Why not look at other effects?
47. A study in Canada shows the smelter's emissions have travelled to Canada. How far have the emissions travelled?
48. What is the economic task force referred to earlier? Public is informed about health effects, but not well informed about economics taken into account in the decision making process.
49. What economic considerations are taken into account? Seems like EPA is only concerned about plant closures and loss of jobs. What about other economic factors such as health costs to affected public, insurance rates, property values, etc?

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Audio tapes of the proceedings of the workshop held in Tacoma August 10, 1983. Originals of the tapes are maintained in the docket in Washington, D.C.

